EXAMINING THE IMPACT OF INDIVIDUAL VARIABLES ON SUPPORT NEEDS AND UNDERLYING RELATIONSHIPS BETWEEN ADULTS' AND CHILDREN'S VERSIONS OF THE SUPPORTS INTENSITY SCALE

By
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ABSTRACT

This dissertation consists of four chapters. Chapter 1 provides an overview of the evolved concept of disability and an introduction of the support needs construct to special education and related disciplines, as well as a summary of studies that examined the support needs of people with intellectual disability. This Chapter also presents research questions that will be addressed in this dissertation. Chapter 2 presents the relationship between individual variables and support needs, both with and without considering the exceptional support needs (medical and behavioral support needs), and investigates the underlying relationships among support needs that form the structure of the Supports Intensity Scale for Adults. The data analyses, using 13,968 protocols from adolescents or young adults with intellectual disability, suggested that age significantly predicts support needs and males tend to have greater support needs than females in Livelong Learning Activities, Employment Activities, Social Activities, and Protection and Advocacy Activities. The findings indicated that the intensity of each domain of support needs varies depending on levels and types of individuals' exceptional support needs. The data also supports the creation of a second-order support-needs construct, using seven factors from both the Support Need Index Scale and the Supplemental Protection and Advocacy Scale. Chapter 3 examined similarities and differences between the Supports Intensity Scale for Adults and the Supports Intensity Scale for Children. The data analyses, using protocols from 142 adolescent students with intellectual disability or related developmental disabilities who completed both versions of the Supports Intensity Scale, suggested the equivalent counterpart indicators and constructs that carry the same information between the two scales. However, the data for this analysis did not fully support the comparability of scores between the two versions of the Supports Intensity Scale. The findings indicated that five pairs of common counterpart constructs are significantly

correlated, evidencing that the two scales have similar underlying mechanisms. The analyses also supported that scores of individuals' IQs and adaptive behaviors negatively predict each support needs area, and the degrees to which these scores predicted the equivalent counterpart constructs are the same. Chapter 4 provides the conclusions of Chapters 2 and 3 and overviews implications for future research and practice pertaining to reducing individuals' support needs and improving the fit between personal capacities and demands of environments.

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Table of Contents

Table of Tables

Table of Figures

CHAPTER 1: INTRODUCTION

The understanding of disability as a construct has evolved over the past few decades, reflecting a paradigm shift from understandings based upon the medical model to conceptualizations emphasizing the social-ecological model (Gordon & Rosenblum, 2001; Thomas, 2004). The medical model of disability, once the dominant conceptual paradigm for understanding disability throughout the early decades of the 20th century, regarded people with disabilities as having inherent impairments for which professionals should provide appropriate remediation treatment to fix their deficits (Hahn, 1989; Linton, 1998). Special education knowledge, practices, and discourses that are influenced by the medical model in both explicit and implicit ways were conceptualized within a positivistic and functional paradigmatic frame as a means to improve conventional diagnostic and instructional practices (Skrtic, 1995). However, in the latter part of the 20th century, significant changes in such understanding emerged with the rise of the social-ecological model. This model conceptualizes disability as a state of being or a state of functioning, which comes from interactions between an individual's capacities and environmental demands, rather than a personal trait (Hahn & Hegamin, 2001; Luckasson & Schalock, 2012; O'Day & Killeen, 2002; Oliver, 1996; Pope & Tarlov, 1991; Rioux, 1997; Schalock, 2011). The key aspect to understanding disability within the social-ecological model is its emphasis on human dignity, personal empowerment, self-determination, and personal rights to improve individuals' pursuit of quality of life (Reindal, 2009; Schalock, 2011). This significant shift was well reflected in the International Classification of Functioning, Disability, and Health model (ICF; World Health Organization, 2001) that conceptualized disability across a wide range of disciplines. Building on feedback that its previous model—the International Classification of Impairments, Disabilities, and Handicaps (ICIDH; World Health Organization,

1980)—received, the new ICF model provided a broader framework for understanding disability by adding the impact of contextual factors to the existing health condition factors. Specifically, the ICF model provided five conceptual dimensions and their dynamic interaction as a means to understand the complicated phenomenon of human functioning and the general construct of disability: health/etiology, body functions and structures, activities, participation, and context of both environmental and personal factors (Buntinx, 2006). It is worth re-emphasizing that disability, namely limitations in human functioning, does not result from a pathology but should be conceived as "multiple interactive processes where each factor can influence the dimensions of functioning and other factors, either directly or indirectly" (Wehmeyer et al., 2008, p. 312).

Efforts to integrate this newly emerging disability paradigm into research and practice become a hallmark for innovative practice in the field of intellectual and developmental disabilities in the past two decades (Brown & Percy, 2007; Finlay & Lyons, 2005; Rioux, 1997; Schalock, 2010, 2011; Switzky & Greenspan, 2006). The significant role that the environment plays in mediating the nature of disability was acknowledged as early as 1972 by Begab and Laveck. These authors, describing the nature of intellectual disability (formerly, mental retardation), noted that "the individual's functional performance is the product of the interaction of his biological makeup and environmental events" (p. 1437). A similar perspective was provided by Sarason and Doris (1979), who described a disability as a transactional phenomenon:

> Mental retardation is quintessentially a social rather than an individual concept implicating the individual and his social context. It is not an etiological concept illuminating the transactions specifically accounting either for the individual's perceived inadequacy or for the characteristics of the social context. It is a concept developed in response to perceived social problems and used to justify action. (p. 38)

Sarason and Doris (1979) argued that we need to understand the concept of mental retardation as a social invention based on the transactional way of thinking. That is, disability is a consequence of how a person influences and is influenced by the social context or social relationships among culture, social history, organizational structure, and constraints of existing ideologies. They urged that this transactional perspective on disability should be translated into diagnosis, research, and practice to improve the quality of life that individuals with disabilities and their family have, which we have been lately addressing.

Subsequently, Mercer (1992) noted that the paradigm in the field of intellectual disability (ID) had moved from a single paradigm to multiple paradigms, emphasizing the use of multi-paradigmatic thinking to most appropriately understand the support needs of each person with intellectual disability. Mercer (1992) summarized the paradigmatic trend in the field of intellectual disability as follows:

> During the early 20th century, the field of mental retardation moved from a medical model to a psychomedical model, which dominated the field for most of the century. Both are located in the most extreme corner of the functionalist-objectivist paradigm. After midcentury, the psychomedical model was challenged by the interpretive paradigm—the social system model and, more recently, the humanistic model. In the 1970s, challenges appeared from models based in the conflict paradigm—first, the cultural pluralism model and, soon after, the conflict model. The historic movement in the field has been toward the greater subjectivity of the interpretive paradigm and the greater recognition of societal heterogeneity of the conflict paradigm. (p. 33)

As seen previously, understanding the construct of disability, including intellectual disability, has become more complex over time. What we should not overlook, however, are social influences

on this paradigm shift. One of the early social movements was the philosophy of normalization, which emphasized the impact of contextual factors and supports in assisting people with intellectual disability to achieve independence and social integration (Nirje, 1969; Wolfensberger, 1972). As emphasized through the landmark book, *The Principle of Normalization in Human Services*, Wolfensberger (1972) discussed the importance of integration, stating that "we are becoming an increasingly pluralistic society in which differences are no longer so apt to be viewed as deviances" (p. 238). He also stressed normalization principles focusing on environmental design of human services and respect toward people with disabilities. Later, Wolfensberger (1983) proposed a new term, Social Role Valorization (SRV), to replace the principle of normalization. The ultimate goal of SRV is to improve the social role of individuals at risk of social devaluation, such as people with intellectual disability, by enhancing personal competencies and their social images in multiple social activities. Correspondingly, human services designed to improve personal competencies and societal changes lie at the center in understanding the SRV, which is consistent with focal points of new disability paradigm.

More recently, the evolving concept of disability was explicitly stated in the preamble to the *United Nations' Convention on the Rights of Persons with Disabilities* as follows: "…disability is an evolving concept […] disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others" (United Nations, 2006, p.1). The total of fifty convention articles aim to ensure the equality and fundamental human rights of all people with disabilities and to promote respect for their inherent dignity, addressing the following domains: rights (accessibility, equality, and privacy); freedom from inhuman or degrading treatment, exploitation, violence, and abuse; independence and participation in the community;

subjective well-being (work and employment, adequate standard of living and social protection, and participation in cultural life, recreation, leisure, and sport); and personal development (education and rehabilitation).

It is also important to note that the shifting perspective of disability, the social-ecological model of disability, has been consistently reflected in disability policies, such as the Individuals with Disabilities Education Improvement Act (IDEIA), Section 504 of the Rehabilitation Act, and the Americans with Disabilities Act (ADA). In particular, IDEIA defines disability as "a natural part of the human experience and in no way diminishes the right of individuals to participate in or contribute to society" (20 U.S.C. Sec. 1400 (c)) and recognizes students' individual variations based on their inherent dignity. Section 504 and ADA also benefit people with disabilities by protecting them against any discrimination, providing reasonable accommodations, and changing ways to educate people with disabilities. All three laws are based on the principle of dual accommodations, which holds the premise that "the student and society must fit each other, the student through education and society by accommodations to the student's disability" and helps members of the society view disability as the product of the interaction between individuals with disabilities and their environments (Turnbull, Stowe, & Huerta, 2007, p. 50).

Consequently, the social-ecological model of disability has influenced the formation of special education practices to provide students with individualized services and support that consider the context in which students must function. For example, Thompson, Hughes, Wehmeyer, and Shogren (2012) illustrated two primary examples of special education practices that focus on improving the fit between the students' capacities and educational contexts: *Universal Design for Learning* (UDL) and *Positive Behavioral Support* (PBS). UDL is based on

the premise that all students should obtain equal opportunities to learn in their learning environments by acquiring multiple means of knowledge representation, expression of understanding, and engagement (CAST, 2013). Rose and Meyer (2002) addressed the idea that "barriers to learning are not, in fact, inherent in the capacities of learners, but instead arise in learners' interactions with inflexible goals, materials, methods, and assessments" (p. vi) and emphasized the importance in incorporating components of UDL into general education classrooms. The implementation of UDL within the school context reflects the underlying assumption of the social-ecological model in the way that it improves the fit between the student's capacities and the educational contexts to which the student belongs. In a similar way, PBS helps students minimize the gap between their capacities and environmental demands by establishing responsive environments. What is essential is that PBS does not focus on fixing people, but on creating and sustaining school environments that reduce students' problem behaviors and help students achieve their social and learning outcomes (Horner, 2000; Turnbull et al., 2002). Carr et al. (2002) reiterated that PBS aims to enhance the quality of life for both individuals with disabilities and persons who support them by changing ecological aspects and supporting students to overcome difficulties in their environments. Moreover, studies to implement the school-wide PBS (SWPBS), creating a systematic and positive learning environment as a whole school system, have been conducted to enhance students' functioning and to benefit the entire school community within the social-ecological model (Horner et al., 2009; Kelm & McIntosh, 2012; McIntosh et al., 2013; Sugai, Keeffe, & Fallon, 2012).

Aside from special education practices, current efforts at education reform have also taken into account the changed understanding of disability. As Sailor (2009) described, *Rethinking Special Education for a New Century* (Finn, Rotherham, & Hokanson, 2001), one of

the publications that addressed ineffectiveness of educating students with disabilities and became the basis for the Individuals with Disabilities Education Act reauthorization, officially reported the actual problems created by the medical model for the first time. Finn et al. (2001) articulated that the medical model emphasizes referral, diagnosis, categorical label, and treatment; thus, it creates "different rules for disabled children foster[ing] a 'separate but unequal' education system" (p. 341). In the same context, Kleinhammer-Tramill, Burrello, and Sailor (2013) indicated that the construct of disability within the medical model places educational problems solely within individuals with disabilities, creating "an unjust and unfair parallel system of programs and services that results in less efficacious outcomes than those realized by students in the general education system" (p. 9). Moving from a continuum of services based on this traditional discrepancy model, efforts to unify special and general education as one system (e.g., response to intervention) emerged to match individuals' needs and demands of their environments. In this respect, Kleinhammer-Tramill et al. (2013) proposed to re-conceptualize special education as "a temporally bounded instructional support system for any student in the public schools who might need support to achieve his or her full capacities" (p.3) and emphasized the concomitant system changes.

In summary, the construct of disability has significantly evolved over past few decades. The most remarkable aspect about this continuous evolution of the paradigm is the increasing recognition of disability as a social and cultural phenomenon. The new conceptualization of disability has correspondingly influenced changes or formation in public policies, educational practices and school reforms, assignment of resources to service programs, and research efforts. Building upon the history of paradigm shift, the following section describes how the construct of

intellectual disability and related studies have been developed within initiatives of the American Association on Intellectual and Developmental Disabilities.

The Evolving Construct of Intellectual Disability

The conceptualization of the construct that is currently referred to as intellectual disability has, internationally, experienced a transition period. Emerson, McConkey, Walsh, and Felce (2008) summarized three current fundamental themes of intellectual disability in a global context: (a) a refocus from a concentration on individuals with disability to studying them within the social contexts in which they live; (b) the crucial influence of the family and society on the lives of people with intellectual disability; and (c) a shift away from an emphasis on specialists and disability services toward empowering and enabling mainstream provision to meet the needs of people with intellectual disability. The American Association on Intellectual and Developmental Disabilities (AAIDD) has played a significant role in leading these international trends in the field of intellectual and developmental disabilities.

An overview of evolutionary changes demonstrated by AAIDD. Since its founding in 1876, AAIDD (formerly the American Association on Mental Deficiency [AAMD] and the American Association on Mental Retardation [AAMR]) has endeavored to help the profession and society understand, define, and classify the condition now called intellectual disability through its terminology and classification manual. The association's contributions have mainly originated from its continous efforts to integrate the evolving understanding of the intellectual disability construct and to disseminate related information to the public over the years. As displayed in Figure 1, the major changes that reflected the new perspectives of disability discussed previously were initially presented in the AAIDD's 9th Edition of *Mental Retardation: Definition, Classification, and Systems of Supports* (Luckasson et al., 1992). Consistent with the

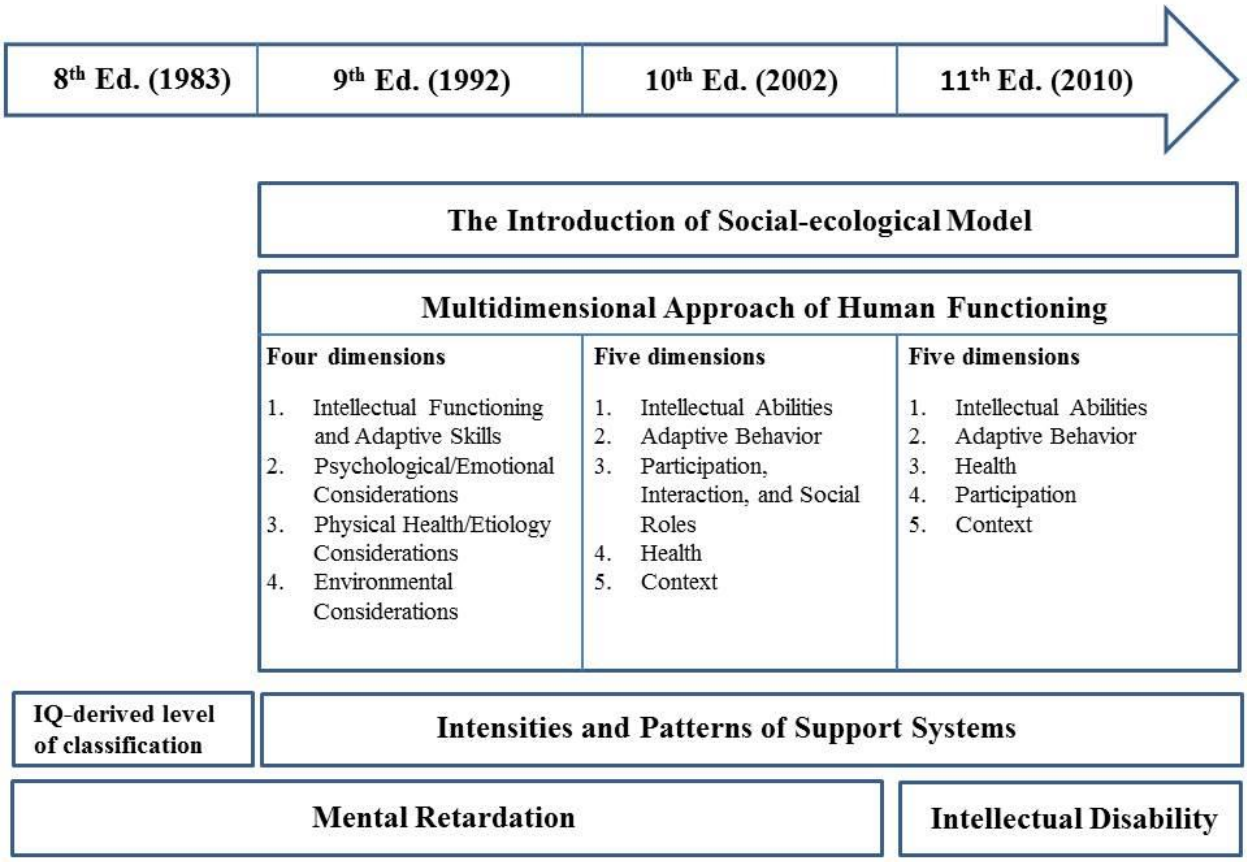


Figure 1. Major changes over past thirty years in the field of intellectual disability.

ICF model that indicated the general construct of disability within the social-ecological framework (WHO, 2001), the 9th Edition proposed a multidimensional model of human functioning and described systems of supports that individuals with mental retardation need in order to enhance their human functioning. Specifically, the 9th Edition introduced four dimensions that are required throughout the process of defining, classifying, and establishing systems of supports for people with intellectual disability: intellectual functioning and adaptive skills, psychological/emotional considerations, physical health/etiology considerations, and environmental considerations (Luckasson et al., 1992). In addition, the 9th Edition originally introduced the concept of intensities and patterns of support systems to provide people with

mental retardation with more functional service delivery and outcomes rather than classifying them into four levels of a degree of deficit (i.e., mild, moderate, severe, and profound). After ten years of experience using the 1992 System, the AAMR's definition was refined by expanding criteria for diagnosis and classification of intellectual disability and by incorporating a fifth dimension of a multidimensional model (i.e., participation, interactions, and social roles). Major features of the classification system remained the same, however, including the use of the term mental retardation, the three diagnostic criteria (i.e., intellectual fuctioning, adaptive behavior, and age of onset), and the emphasis on functioning orientation and supports (Luckasson et al., 2002).

In 2010, AAIDD released the 11th Edition titled *Intellectual Disability: Definition, Classification, and Systems of Support* (Schalock et al., 2010), building upon the 9th and 10th Editions of the Manual and a series of five articles that addressed reflections of the AAIDD Ad Hoc Committee on Terminology and Classification on: (a) terminology and definition of intellectual disability (Schalock et al., 2007), (b) the intellectual disability construct and its relation to human functioning (Wehmeyer et al., 2008), (c) conceptualization of supports and support needs of people with intellectual disability (Thompson et al., 2009), (d) characteristics and needs of people with intellectual disability who have higher IQs (Snell et al., 2009), and (e) public policy and the enhancement of desired outcomes for people with intellectual disability (Shogren et al., 2009). The significant changes in the 11th Edition included its use of the term, intellectual disability, that "covers the same population of individuals who were diagnosed previously with mental retardation in number, kind, level, type, and duration of the disability and the need of people with this disability for individualized services and supports" (Schalock et al.,

2010, p. xvi). As Schalock et al. (2007) emphasized in the first series of articles, the terminology shift from mental retardation to intellectual disability was important for the following reasons:

> The term intellectual disability (a) reflects the changed construct of disability described by the AAIDD and WHO, (b) aligns better with current professional practices that focus on functional behaviors and contextual factors, (c) provides a logical basis for individualized supports provision due to its basis in a social ecological framework, (d) is less offensive to persons with the disability, and (e) is more consistent with international terminology. (p. 118)

Aside from these reasons that underlie the terminology shift, it is important to understand the distinction between operational and constitutive definitions of the intellectual disability construct. The operational definition of intellectual disability focuses on the operations of the intellectual disability construct that can be observed or measured, so that it can provide information related to diagnosis and classification (Schalock et al., 2010; Wehmeyer et al., 2008). As seen in Appendix A, the three criteria defining intellectual disability in an operational way—intellectual functioning, adaptive behaviors, and age of onset—have been consistent over the last 50 years. However, the constitutive definition of intellectual disability, which helps to explain the theoretical foundation of the construct and provides information for theory or model development, was significantly changed to incorporate intellectual disability construct within a social-ecological perspective in the 9th Edition of the manual, although the term used did not change at that time. The 11th Edition of the manual, in particular, reflects the changed constitutive definition of intellectual disability that is resulted from the terminology shift from mental retardation to intellectual disability. Wehmeyer et al. (2008) explained the shift in the constitutive definition of intellectual disability as:

> Intellectual disability involves limitations in human functioning. What was, however, dramatically different with the construct underlying the term intellectual disability when compared with the construct underlying the term mental retardation was where the disability resided; the former (mental retardation) viewed the disability as a defect within the person, whereas the latter (intellectual disability) viewed the disability as the fit between the person's capacities (implied in that is limited capacity as function of neural impairment) and the context in which the person functioned. (pp. 313-314)

The ad hoc committee's work to change the terminology from mental retardation to intellectual disability has significantly impacted succeeding legal initiatives. For example, President Barack Obama signed Rosa's Law in October 2010 (P.L. 111-256) to substitute *intellectual disability* for mental retardation in federal education, health, and labor laws, including IDEIA, the Public Health Service Act, and Rehabilitation Act. Rosa's Law (2010) did not cover titles II and XVI of the Social Security Act (SSA), which resulted in unchanged references to mental retardation in its regulations. However, in August 2013, the Social Security Administration decided to change the term mental retardation to *intellectual disability* in SSA's Listing of Impairments and other appropriate sections of its rules, going along with the current trends to use the term *intellectual disability* in Congress, government agencies, and other public and private organizations (Social Security Administration, 2013). In addition, the American Psychiatric Association (APA) followed AAIDD's lead on definition and classification of intellectual disability to a certain degree, by renaming what was previously referred to as mental retardation to *intellectual disability (intellectual developmental disorder)* in its fifth edition of the Diagnostic and Statistical Manual on Mental Disorders (DSM-5, 2013). In a similar manner, WHO proposed *disorders of intellectual development* to replace mental retardation in its soon to

be published manual of International Statistical Classification of Diseases and Related Health Problems-11 (ICD-11, 2015), based on AAIDD's recommendations (as cited in Fujiura, 2013). Though differences in terminology remain, primarilay as a function of the purpose of diagnostic and classfication schemes (e.g., ICD is a classification of diseases and disorders, and not disability, which is covered by the ICF, and thus cannot use the word "disability" in its system), the clear trend, internationlly, is on the adoption of the term intellectual disability.

The Importance of Support Needs

To conceptualize disability as a multidimensional state of human functioning that interplays with environmental demands, understanding supports and the construct of support needs is critical (Schalock et al., 2010). Supports are "resources and strategies that aim to promote the development, education, interests, and personal well-being of a person and that enhance individual functioning" (Luckasson et al., 2002, p. 151). Support needs is, on the other hand, "a psychological construct referring to the pattern and intensity of supports necessary for a person to participate in activities linked with normative human functioning" (Thompson et al., 2009, p. 135). Understanding support needs is closely related to a constitutive definition of intellectual disability, primarily due to its focus on reducing the mismatch between an individual's competencies and the demands of the environment where the person lives, learns, works, or plays to enhance human functioning and promote desired personal outcomes (Schalock, Gardner, & Bradley, 2007; Schalock et al., 2010; Thompson et al., 2009). Thompson and colleagues (2009) further provided an assumption underlying the construct of support needs; people with intellectual disability need ongoing and extraordinary patterns of support, when compared to their peers without intellectual disability, to enhance or maintain successful human functioning in typical activities.

To integrate support needs into assessment and support planning, Thompson et al. (2009) refined a five-component sequential process, building on its previous planning model (Thompson et al., 2002). As seen in Figure 2, the five-component process includes (a) identifying desired life experiences and goals, (b) assessing support needs, (c) developing and implementing the individualized plan, (d) monitoring progress, and (e) evaluating. The process begins with assessing personal interests based on person-centered planning that emphasizes "the voices of the person and of those who know the person best in accounting for his or her history, evaluating his or her present conditions in terms of valued experiences, and defining desirable changes in his or her life" (O'Brien & O'Brien, 2002, pp. 6-7). In addition, support plans need to be updated as people mature or encounter new life events, which means the comprehensive identification of support needs lies at the heart of this iterative cycle of components for delivering individualized supports. The AAIDD developed the *Supports Intensity Scale* (Thompson et al., 2004a), added several changes to this original scale, and named the updated version the *Supports Intensity Scale for Adults* (SIS-A) (Thompson et al., in press) so as to facilitate the aforementioned process and, ultimately, to improve individual human functioning in multiple activities of daily life (Thompson et al., 2004b). Recently, AAIDD initiated the development of the *Supports Intensity Scale for Children* (SIS-C) (Thompson et al., 2012) to assess relative intensity, duration, and type of supports that students in ages 5 to 16 need across multiple environments and contexts. The SIS-A and the SIS-C can be used in the second of the five components of the individualized planning process and provides information for developing individualized support plans in the third component. Furthermore, the Supports Intensity Scale (SIS) provides a basis for ongoing monitoring and evaluation processes, components four and five, to establish the quality of the individualized support plan.

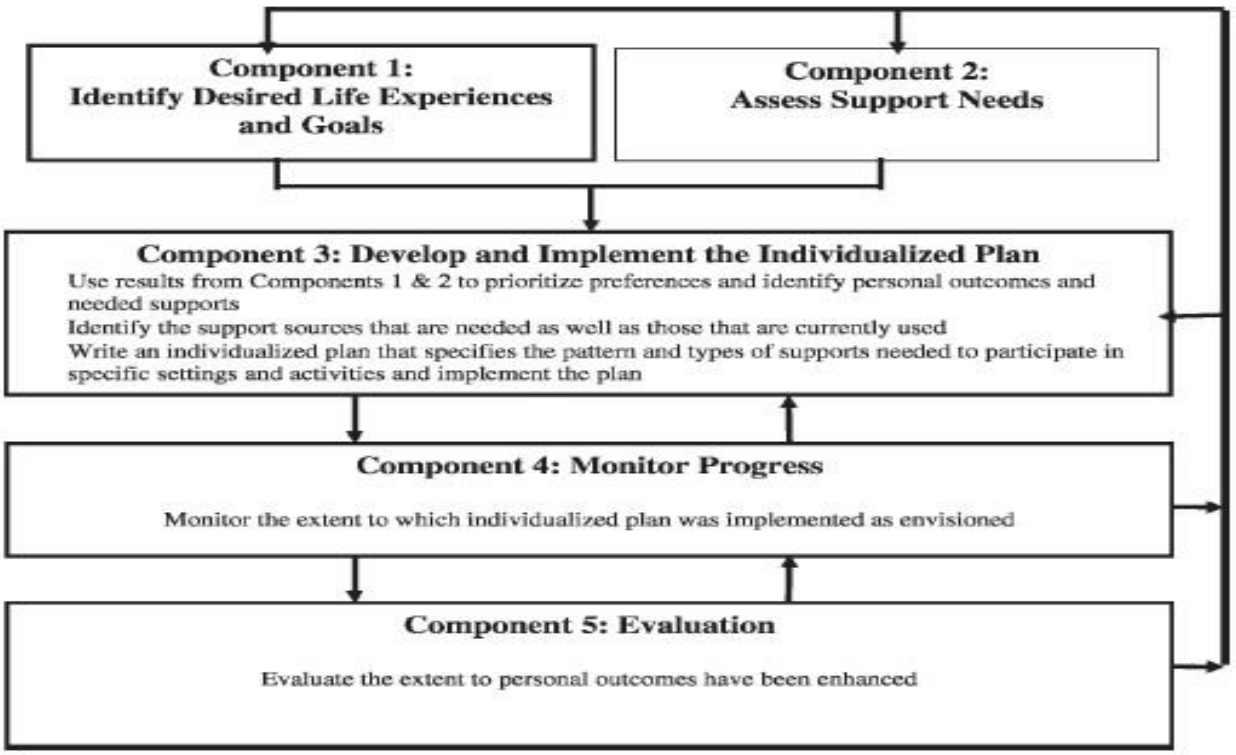


Figure 2. A process for assessing, planning, monitoring, and evaluating individualized supports. Adapted from Thompson et al. (2009).

As further discussed in Chapters 2 and 3, studies that examine versions of SIS, including both adults' and children's versions, are at relatively early stages. Hughes, Wehmeyer, and Thompson (2011) indicated that 15 empirical articles on the SIS-A were published, with the majority of these studies being published since 2008. Hughes et al. (2011) categorized these 15 studies with the following themes: "(a) studies examining psychometric properties of the English version of the SIS; (b) studies examining psychometric properties of translated version of the SIS; (c) studies using the SIS to establish concurrent validity with another assessment instrument measuring support needs; and (d) studies examining application of SIS scores to resource allocation models" (p.11). Further research is also needed to (a) determine which individual or contextual variables impact support needs of individuals with intellectual or developmental

disabilities, (b) identify the mediating or moderating effects of individual or contextual variables on support needs to enhance desired personal outcomes in practice, and (c) design, validate, and implement interventions to minimize individuals' support needs.

With regard to the SIS-C, a pilot test was completed with participants from Illinois, North Carolina, and Tennessee (Hughes et al., 2011). The research team is currently norming the SIS-C, collecting 3,400 protocols from both State intellectual and developmental disabilities support systems and school systems. Other relevant development activities are also in process to evaluate reliability and validity of the SIS-C as a standardized measure and to assess its utility in both school and community settings. Correspondingly, there exist many research directions to examine the efficacy of the SIS-C, including examining psychometric properties of the measurement, its use for identification of and planning for support provisions, the application of SIS scores in research and practice, and the relationship among SIS scores and students' demographic variables, level of intellectual disability, and level of adaptive skills. Given that the SIS-C is being developed based on the structure and items of the SIS-A, it seems logical to examine any similarities and differences between these two versions as an initial study to facilitate further research and provide guidance for its use in future studies.

Research Questions

The primary purpose of this dissertation is to expand the extant knowledge related to both the SIS-A and the SIS-C. Based on research needs identified in the previous section, two studies were conducted that addressed the two versions of the SIS to fill the gap in the literature. Findings from these studies will provide practitioners and parents with the basis for developing effective support plans and support young people with intellectual disability to achieve greater

personal independence, full participation, and an enhanced quality of life. Each study is described as follows.

Study 1: Examining relationships between individual variables and support needs of adolescents and young adults with intellectual disability. The purpose of the first study is to address the impact of individual variables on each domain of support needs and to examine inter-relationships among subscales of the SIS-A with adolescents and young adults with intellectual disability. Specific research questions, along with null hypotheses (H_0^x) and alternative hypotheses (H_a^x), are provided below.

1. Do age and gender impact the support needs of adolescents and young adults with intellectual disability?

   H_0^1: Age and gender will not impact the support needs of adolescents and young adults with intellectual disability.

   H_a^1: Age and gender will impact the support needs of adolescents and young adults with intellectual disability.

2. Can support needs be comparably measured for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?

   H_0^2: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, cannot be established for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs.

   H_a^2: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, can be established for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs.

3. Are there mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?

   H_0^3: There will be no mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs.

   H_a^3: There will be mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs.

4. Do age and gender impact support needs of adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?

   H_0^4: Age and gender will not impact support needs for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs.

   H_a^4: Age and gender will impact support needs for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs.

5. Can support needs be comparably measured for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs?

   H_0^5: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, cannot be established for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs.

H_a^5: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, can be established for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs.

6. Are there mean level differences in support needs for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs?

   H_0^6: There will be no mean level differences in support needs for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs.

   H_a^6: There will be mean level differences in support needs for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs.

7. Do age and gender impact support needs of adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs?

   H_0^7: Age and gender will not impact support needs for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs.

   H_a^7: Age and gender will impact support needs for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs.

8. Can support needs be comparably measured for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs?

H_0^8: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, cannot be established for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs.

H_a^8: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, can be established for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs.

9. Are there mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs?

H_0^9: There will be no mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs.

H_a^9: There will be mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs.

10. Do age and gender impact support needs of adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs?

H_0^{10}: Age and gender will not impact support needs for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs.

H_a^{10}: Age and gender will impact support needs for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs.

11. Can support needs be comparably measured for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs?

    H_0^{11}: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, cannot be established for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs.

    H_a^{11}: Construct comparability, as demonstrated by strong factorial invariance testing of the manifest indicators, can be established for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs.

12. Are there mean level differences in support needs for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs?

    H_0^{12}: There will be no mean level differences in support needs for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs.

    H_a^{12}: There will be mean level differences in support needs for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs.

13. Do age and gender impact support needs of adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs?

H_0^{13}: Age and gender will not impact support needs for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs.

H_a^{13}: Age and gender will impact support needs for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs.

14. Are constructs measured by the *Support Needs Index Scale* and by the *Supplemental Protection and Advocacy Scale* highly correlated?

H_0^{14}: Constructs measured by the *Support Needs Index Scale* and by the *Supplemental Protection and Advocacy Scale* will not be highly correlated.

H_a^{14}: Constructs measured by the *Support Needs Index Scale* and by the *Supplemental Protection and Advocacy Scale* will be highly correlated.

15. Can a higher-order construct be comprised of seven constructs measured both by the *Support Needs Index Scale* and the *Supplemental Protection and Advocacy Scale*?

H_0^{15}: Constructs measured by the *Support Needs Index Scale* and by the *Supplemental Protection and Advocacy Scale* will not create a higher-order construct.

H_a^{15}: Constructs measured by the *Support Needs Index Scale* and by the *Supplemental Protection and Advocacy Scale* will create a higher-order construct.

Study 2: Examining underlying relationships between the SIS for Adults and the SIS for Children. The purpose of the second study is to conduct a preliminary comparison of the underlying constructs that form the structure of the SIS-A with those of the SIS-C to analyze similarities or differences. Specific research questions are as follows, along with null hypotheses (H_0^x) and alternative hypotheses (H_a^x).

1. Can the construct comparability be partially established for the SIS-A and the SIS-C?

   H_0^1: Construct comparability, as demonstrated by the partial strong factorial invariance testing of manifest indicators, cannot be established for the SIS-A and the SIS-C.

   H_a^1: Construct comparability, as demonstrated by the partial strong factorial invariance testing of manifest indicators, can be established for the SIS-A and the SIS-C.

2. Are there mean level differences in common support needs when measured by the SIS-A and the SIS-C?

   H_0^2: There will be mean level differences in common support needs when measured by and the SIS-A and the SIS-C.

   H_a^2: There will be no mean level differences in common support needs when measured by the SIS-A and the SIS-C.

3. Are counterpart constructs of the SIS-A and the SIS-C highly correlated?

   H_0^3: Counterpart constructs measured by the SIS-A and the SIS-C will not be highly correlated.

   H_a^3: Counterpart constructs measured by the SIS-A and the SIS-C will be highly correlated.

4. Do students' levels of intelligence and adaptive behavior impact support needs measured by the SIS-A?

   H_0^4: The latent construct, composed by scores from students' levels of intelligence and adaptive behavior, will not impact support needs measured by the SIS-A.

   H_a^4: The latent construct, composed by scores from students' levels of intelligence and adaptive behavior, will impact support needs measured by the SIS-A.

5. Do students' levels of intelligence and adaptive behavior impact support needs measured by the SIS-C?

   H_0^5: The latent construct, composed by scores from students' levels of intelligence and adaptive behavior, will not impact support needs measured by the SIS-C.

   H_a^5: The latent construct, composed by scores from students' levels of intelligence and adaptive behavior, will impact support needs measured by the SIS-C.

6. Does the latent construct consisting of intelligence and adaptive behavior have the same impact on each counterpart latent construct of the SIS-A and the SIS-C?

   H_0^6: The latent construct, composed by scores from students' levels of intelligence and adaptive behavior, will not have the same impact on each counterpart latent construct of the SIS-A and the SIS-C.

   H_a^6: The latent construct, composed by scores from students' levels of intelligence and adaptive behavior, will have the same impact on each counterpart latent construct of the SIS-A and the SIS-C.

CHAPTER 2: EXAMINING RELATIONSHIPS BETWEEN INDIVIDUAL VARIABLES AND SUPPORT NEEDS OF ADOLESCENTS AND YOUNG ADULTS WITH INTELLECTUAL DISABILITY

The Supports Intensity Scale was developed to reflect changes in society's perceptions of people with disabilities and in human services targeted to people with intellectual disability or closely related developmental disabilities. The five major trends that generated the need for the SIS include (a) more positive expectations for the lives of people with intellectual disability, (b) a focus on functional descriptions of disabling conditions, (c) the emphasis on chronological-age-appropriate activities, (d) the emergence of a consumer-driven approach, and (e) the need for creating and nurturing support networks that provide individualized supports (Thompson et al., 2004b). The idea that overarches these five trends comes from the increased emphasis on the dignity of and antidiscrimination towards people with disabilities, as discussed in Chapter 1. The SIS was published in 2004 as a means to assess the extraordinary support needs of people with intellectual disability ages from 16 to 64 years and to develop, monitor, and evaluate individual support plans based on identified support needs. Based on the feedback collected from SIS users, AAIDD added several features to the original SIS and named the updated version the SIS for Adults (SIS-A) (Thompson et al., in press). The primary changes include (a) additional demographic information to fill in the cover page, (b) reordering the sections and subscale items on both the paper form and SISOnline, and (c) an updated user's manual that contains new information. It is important to note that the standard scores of the SIS and the SIS-A are the same despite some changes in measurement elements (AAIDD, 2013).

The SIS is unique compared to traditional instruments that measure personal competencies, such as intelligence tests and adaptive behavior scales (Thompson et al., 2004b).

Scales measuring intelligence and adaptive behavior are used to diagnose intellectual disability and to identify areas of personal incapacity to determine eligibility, students' relevant instructional needs, or educational goals. However, the SIS is designed to measure support needs so as to reduce mismatch between personal capacities and environmental demands. Outcomes from the SIS-A are now variously used by ample entities (e.g., organizations, states, and regions). For example, the support profile obtained from subscales of the SIS can assist planning teams and caregivers to align resources and strategies to improve desirable personal outcomes. The normative data on support needs, an overall support needs score, can be used for grouping for service reimbursement or funding, research, provision of services and supports, and effective communication (Schalock et al., 2010). Adopting the SIS-A to fulfill aforementioned purposes is a significant change that reflects the evolved understanding of disability, because factors to determine eligibility for State ID/DD services have not addressed individual support needs but, primarily, involved proxy indicators for support needs, such as IQ scores and adaptive behavior data (Hughes et al., 2011).

The SIS-A has demonstrated strong psychometric characteristics, as evidenced by scores of reliability and validity tests. The original SIS *Users Manual* provided information regarding five indices of reliability: (a) internal consistency, (b) standard error of measurement, (c) test-retest, (d) interrater, and (e) interscorer (Thompson et al., 2004b). First, reliability related to internal consistency estimates the degree of homogeneity among SIS items using Cronbach's coefficient (1951) alpha method. Internal consistency coefficients for all subscales far exceeded .90, which demonstrated adequate reliability for assessment scales. Second, the standard error of measurement (SEM) examines the confidence interval that surrounds a particular test score to estimate the test's accuracy. The SEM scores were small for the average

of SIS subscales and for each SIS subscale score (i.e., 1.5), providing additional evidence for the accuracy of the SIS. Third, the same rater collected test-retest data with an interval of about three weeks between two interviews to establish test-retest reliability. Based on criteria provided by Cicchetti and Sparrow (1981), test-retest reliability coefficients turned out to be solid (i.e., coefficients greater than .75) with only one domain not exceeding .75, Community Living, which had a coefficient computed at .74 and, thus, was still considered a good indicator. Fourth, to establish inter-rater reliability, interviewers independently administered the SIS on each individual to be rated during the same period. The inter-rater reliability coefficients were not as strong. Only the *Home Living* subscale showed a solid coefficient value that reaches Cicchetti and Sparrow's standard, and inter-rater reliability for the total score was computed at .59. Subsequent research, however, on which the raters were trained initially, established higher and satisfactory inter-rater reliability scores (Thompson, Tassé, & McLaughlin, 2008). Finally, interscorer reliability coefficients were computed by two independent individuals based on 50 protocols that were randomly selected from the standardization sample. The interscorer reliability was excellent because coefficients were greater than .997 for both all subscales and the total score.

In addition, the SIS-A demonstrated strong evidence in the following validity tests: content validity, criterion-related validity, and construct validity (Thompson et al., 2004b). First, the content validity was established by the literature review and Q-sort methodology (McKeown & Thomas, 1988) to categorize indicators in support-activity domains. Three field tests were conducted to refine the scale using the pilot version of the SIS, which consisted of eight support domains (i.e., Home Living, Community Living, Education and Training, Employment, Health and Safety, Behavioral, Social, and Protection and Advocacy). Based on interrater reliability

results from those field tests, the committee members decided to create a separate supplemental section of the Protection and Advocacy subscale because the discrepancy in interrater scores would bias an overall Support Needs Index. Additionally, content validity of items from the SIS subscales was established based on the item analysis, as evidenced by item discrimination coefficients for each subscale ranging between .66 and .72. Second, the criterion-related validity was examined by asking SIS respondents to complete a 5-point Likert scale (1 = *low support needs* to 5 = *high support needs*) prior to the actual administration of the SIS. The SIS results and corresponding ratings on the Likert-type scale were intercorrelated and all coefficients were significant and greater than .35, the minimum value to establish the criterion-related validity (Hammill, Brown, & Bryant, 1992). Third, construct validity is related to measuring the underlying theoretical characteristic or concept that the scale is based on. Studies to establish the construct validity have been consistently conducted, including efforts to identify relationships between the SIS and measures of adaptive behavior. There have been mixed study findings that addressed relationships between support needs and adaptive behavior. Harries, Guscia, Kirby, Nettelbeck, and Taplin (2005) examined relationships between a pilot version of the SIS and two adaptive behavior scales: the *Adaptive Behavior Scale-Residential and Community (ABS-RC:2)* (Nihira, Leland, & Lambert, 1993) and the *Inventory for Client and Agency Planning (ICAP)* (Bruininks, Hill, Weatherman, & Woodcock, 1986). These authors, using factor analyses, found a strong association between support needs and adaptive behavior and suggested the SIS does not measure different constructs compared with those of adaptive behavior scales. Thompson et al. (2004b), however, compared SIS subscale scores with the *ICAP* and the *Vineland Adaptive Behavior Scales (VABS)* (Sparrow, Balla, & Cicchetti, 1984) and found that the SIS and adaptive behavior scales measure separate constructs. The results from Thompson et al. (2004b) were

supported by findings from Wehmeyer et al. (2009) that compared scores from the SIS and *Developmental Disability Profile (DDP)* (Brown et al., 1986) to examine the efficacy of the SIS in predicting extraordinary support needs. The *DDP*, generally used for adaptive behavior scales, measures an individual's personal competence including adaptive behavior, maladaptive behavior, and medical/health conditions. The findings from this study suggested that the SIS measures a different construct than what *DDP* measures, indicating that Harries et al. (2005)'s inconsistent results, in part, come from its use of a prepublication version of the SIS and less-generalizable sampling method. Further, just as academic achievement and IQ score are highly correlated but considered separate constructs, so too adaptive behavior and support needs share common themes and purposes, but diverge primarily in that adaptive behavior is a construct referring to the abilities of a person, while support needs refers to the support a person needs to function successfully in typical environments.

Based on aforementioned processes that established the satisfactory technical properties of the SIS, the SIS-A was published in three sections: The Support Needs Index Scale, The Supplemental Protection and Advocacy Scale, and The Exceptional Medical and Behavioral Support Needs. The first section, The Support Needs Index Scale, consists of 49 life activities that are categorized in six support subscales, including activities of Home Living, Community Living, Lifelong Learning, Employment, Health and Safety, and Social. The second section, The Supplemental Protection and Advocacy Scale, consists of eight protection and advocacy related activities that are excluded when determining the overall SIS Support Needs Index (SNI). The last section, The Exceptional Medical and Behavioral Support Needs, is composed of 15 medical conditions and 13 challenging problem behaviors. These items are identified based on the assumption that people with higher medical support needs and/or severe problem behaviors

would need more intense overall support needs (Tassé & Wehmeyer, 2010; Thompson et al., 2004b).

It is promising that the SIS-A includes an underlying assumption pertaining to exceptional support needs that consider the existence of individuals' health-related issues or problem behaviors. In fact, researchers have consistently reported strong relationships between medical conditions and the intensity of support that individuals with intellectual disability might need. For example, Cooper, Melville, and Morrison (2004) called for supports or reasonable adjustments for people with intellectual disability who have unique health needs, suggesting that their higher levels of health needs are not often recognized and satisfied. The existing body of literature primarily focuses on identifying care burdens or experiences of families of children with complex needs, including children who are more dependent on advanced medical technologies (Redmond & Richardson, 2003; Rehm & Bradley, 2005) or evaluating quality of services provided by proxies of people with intellectual disability (Koch, Marks, & Tooke, 2001; Lennox, Diggens, & Ugoni, 1997; Melville et al., 2005). So far, however, there is no study that directly examined support needs of individuals with intellectual disability who have more extensive medical needs using validated instruments.

Compared with studies on medical support needs, however, there is a relatively large body of literature that addresses the nature, degree, and impact of challenging behaviors demonstrated by individuals with intellectual disability (Harvey, Boer, Meyer, & Evans, 2009; Heyvaert, Maes, & Onghena, 2010; Rojahn & Tassé, 1996). Numerous studies focused on increased levels of stress on families, teachers, and caregivers who experience challenging behaviors of individuals with intellectual disability (Douma, Dekker, & Koot, 2006; Gavidia-payne, 2002; Hastings & Beck, 2004; Hastings, Daley, Burns, & Beck, 2006; Lecavalier, Leone,

& Wiltz, 2006; Mitchell & Hastings, 2001). Additionally, studies have reported that the presence of problem behaviors requires greater expenditures to provide specialized support, urging the development of cost-effective means to provide such support (Allen, Lowe, Moore, & Brophy, 2007; Hassiotis, Parkes, Jones, Fitzgerald, & Romeo, 2008; Knapp, Comas-Herrera, Astin, Beecham, & Pendaries, 2005; Stancliffe & Lakin, 2005). To date, however, there exist only a few studies that examined the direct relationship between support needs and problem behaviors demonstrated by individuals with intellectual disability. Lamoureux- Hébert, Morin, and Crocker (2010) found that challenging behaviors assessed by *Behavior Problems subscale of the Scales of Independent Behavior-Revised* (SIB-R) (Bruininks, Woodcock, Weatherman, & Hill, 1996) significantly increase the intensity of support needs measured by the French translation of the SIS (Lamoureux-Hébert & Morin, 2009). Another interesting finding was that the presence of behavioral problems influences support needs as much as a person's level of intellectual functioning (i.e., mild and moderate). In addition, Lamoureux-Hebert et al. (2010) concluded that the frequency of challenging behavior more significantly impacted support needs than did the severity of the problem behavior.

It is important to note that "intellectual disability occurs along a continuum, as does intellectual ability" (Snell et al., 2009, p. 230). By definition, all people with intellectual disability have exceptional support needs with regard to successfully functioning in multiple daily activities and to be meaningfully included in such contexts (Schalock et al., 2010). People with intellectual disability who have higher medical and/or behavioral support needs consequently require a wide range or different patterns of support needs compared with people who have intellectual disability without or with lower levels of exceptional medical or behavioral support needs. In particular, it is critical to examine issues pertaining to support needs for

adolescents and young adults with intellectual disability because the point of transition from high school to adult life is an important stage for them to function in different daily activities, to manage changing roles, and to establish independence (Wehmeyer & Webb, 2012). Thus, the primary purpose of this study was to examine the impact of individual variables (i.e., age and gender) on the support needs of adolescents and young adults with intellectual disability, as well as to compare support needs between different sub-groups categorized by individuals' levels of medical or behavioral exceptional support needs. The second purpose of this study was to determine the dimension(s) underlying the SIS-A with adolescents and young adults with intellectual disability. The analyses in this study addressed six main research questions as follows:

1. Do age and gender impact the support needs of adolescents and young adults with intellectual disability?
2. Are support needs differently measured for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?
    - 2-1. Can support needs be comparably measured for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?
    - 2-2. Are there mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?
    - 2-3. Do age and gender impact support needs of adolescents and young adults with higher medical support needs compared with individuals with lower medical support needs?

3. Are support needs differently measured for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavior support needs?
    - 3-1. Can support needs be comparably measured for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs?
    - 3-2. Are there mean level differences in support needs for adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs?
    - 3-3. Do age and gender impact support needs of adolescents and young adults with higher behavioral support needs compared with individuals with lower behavioral support needs?
4. Are support needs differently measured for adolescents and young adults with higher medical support needs compared with individuals with higher behavior support needs?
    - 4-1. Can support needs be comparably measured for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs?
    - 4-2. Are there mean level differences in support needs for adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs?
    - 4-3. Do age and gender impact support needs of adolescents and young adults with higher medical support needs compared with individuals with higher behavioral support needs?

5. Are support needs differently measured for adolescents and young adults with lower medical support needs compared with individuals with lower behavior support needs?
    5-1. Can support needs be comparably measured for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs?
    5-2. Are there mean level differences in support needs for adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs?
    5-3. Do age and gender impact support needs of adolescents and young adults with lower medical support needs compared with individuals with lower behavioral support needs?
6. Does the SIS for Adults have one underlying support needs dimension?
    6-1. Are constructs measured by the *Support Needs Index Scale* and by the *Supplemental Protection and Advocacy Scale* highly correlated?
    6-2. Can a higher-order construct be comprised of seven constructs measured by both the *Support Needs Index Scale* and the *Supplemental Protection and Advocacy Scale*?

Method

Participants

The participants were 13,968 adolescents or young adults with intellectual disability. Participants were recruited from urban, rural, and suburban school districts or intellectual and developmental disabilities organizations across 23 states in America (Alabama, Arkansas, California, Colorado, Delaware, Kansas, Kentucky, Massachusetts, Maryland, Michigan,

Minnesota, New Hampshire, New Jersey, New Mexico, Nevada, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, Vermont, Virginia, and Washington) and two provinces of Canada (Alberta and British Columbia) from August 2009 to August 2012.

Participants ranged in age from 16.0 to 22.9 years at the time of testing (M = 20.08; SD = 1.99) and age distribution is provided in Table 1. Female participants constituted 38.2% (n = 5,333) of the sample, while male participants constituted 61.8% (n = 8,635) of the sample. About 39.0% of the total participants (n = 5,453) had higher medical support needs, whereas 61.0% of the total participants (n = 8,515) had lower medical support needs. About 46.8% of the total participants (n = 6,538) belonged to a group with higher behavioral support needs and the rest of the total participants consisted of a group with lower behavioral support needs (n = 7,430, 53.2%). Ways to classify participants into two groups based on levels of medical or behavioral support needs, respectively, were derived from the *SIS User's Guide* (Thompson et al., 2004b). That is, if respondents indicated the person's needs by circling at least one item in the medical support as *Extensive Support Needed*, that person belonged to a group with higher medical support needs. The same grouping method was applied when creating two groups based on the intensity of behavioral support needs.

In terms of the SIS Support Needs Index (SNI; the total standard score), younger participants tended to have higher scores that did older participants. Scores of the SNI are normally distributed, with a mean of 100 and a standard deviation of 15; a higher SIN represents the higher level of support needs (Thompson et al., 2004b). As seen in Table 1, participants who were 16, 17, 18, 19, 20, 21, and 22 years old had age-related averages of SNI, yielding 103.88, 101.67, 102.16, 99.80, 98.60, 97.46, and 95.92, respectively. The *SIS Manual* (Thompson et al., 2004b) describes 4 classification schemes using the SNI: (a) Level 1 = 84 or less, (b) Level II =

85 – 99, (c) Level III = 100 – 115, and (d) Level IV = 116 or more. The average SNI from each age group was contained in either Level II or Level III. To display the pattern of SNI based on participants' ages and levels of support needs, total participants in each age group were divided by three sub-groups based on their SNI. One-third of the participants who had the highest SNI belonged to a higher group; another one-third of the participants who had the lowest SNI belonged to a lower group. As displayed in Table 1 and Figure 3, the average scores of SNI in the lower group appeared to have a sharper decrease than those from the higher group, as participants aged. With respect to gender, females and males tended to have similar SNI scores (females = 98.64, males = 99.32).

When it came to respondents of the interview, as seen in Table 2, family members were the primary first respondents (*n* = 5,430, 38.87%), followed by service coordinators (*n* = 3,516, 25.17%) and individuals themselves (*n* = 1,582, 11.33%). Regarding second respondents, family members responded most often (*n* = 3,070, 21.98%), followed by service/program coordinators (*n* = 2,469, 17.68%) and education service providers (*n* = 1,195, 8.56%).

Table 1

Demographic Characteristics of Study Participants being Rated

	Medical Support Needs Group				Behavioral Support Needs Group				Total		Support Needs Index					
	Higher (N = 5,453)		Lower (N = 8,515)		Higher (N = 6,538)		Lower (N = 7,430)		(N =13,968)				Mean			
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	Min	Max	Higher*	Lower*	Total	*SD*
Age																
16	609	11.17	552	6.48	644	11.17	517	6.96	1,161	8.31	56	131	91.96	114.52	103.88	10.79
17	770	14.12	868	10.19	897	14.12	741	9.97	1,638	11.73	56	138	87.29	113.94	101.67	12.65
18	628	11.52	730	8.57	763	11.52	595	8.01	1,358	9.72	56	132	89.53	113.33	102.16	11.20
19	659	12.09	946	11.11	830	12.09	775	10.43	1,605	11.49	57	137	85.65	112.52	99.80	12.47
20	837	15.35	1,316	15.46	1,089	15.35	1,064	14.32	2,153	15.41	54	136	83.37	112.47	98.60	13.24
21	1,037	19.02	2,059	24.18	1,224	19.02	1,872	25.20	3,096	22.16	54	143	82.05	111.54	97.46	13.55
22	913	16.74	2,044	24.00	1,091	16.74	1,866	25.11	2,957	21.17	54	143	79.99	110.68	95.92	13.97
Gender																
Female	2,079	38.13	3,254	38.21	2,524	38.13	2,809	37.81	5,333	38.2	54	143	83.06	112.60	98.64	13.59
Male	3,374	61.87	5,261	61.79	4,014	61.87	4,621	62.19	8,635	61.8	54	143	55.42	112.44	99.32	12.92

Note. * Participants are divided by three groups based on their scores of Support Needs Index (SNI). One-third of the participants who have the highest SNI belonged to a higher group; another one-third of the participants who have the lowest SNI belonged to a lower group.

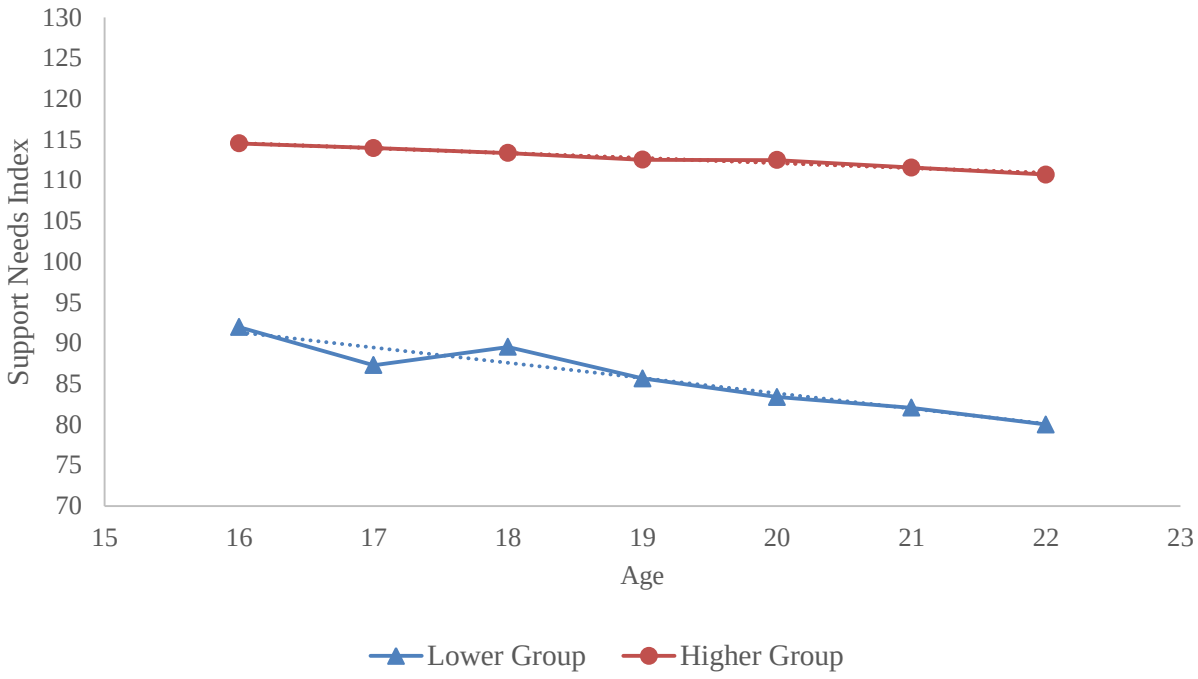


Figure 3. The pattern of Support Needs Index across participants' age range.

Table 2

Demographic Characteristics of Respondents

	First Respondent		Second Respondent	
	n	*%*	*n*	*%*
Family members	5,430	38.87	3,070	21.98
Poster parent/Guardians	181	1.30	148	1.06
Education service providers	89	0.64	1,195	8.56
Self	1,582	11.33	951	6.81
Residential support providers	163	1.17	309	2.21
Family-related support providers	10	0.07	14	0.10
Service/Program coordinators	3,516	25.17	2,469	17.68
Social workers	11	0.08	9	0.06
Case managers	74	0.53	82	0.59
Advocators	7	0.05	7	0.05
Community service providers	2	0.01	1	0.01
Others (translator, neighbor, observer, etc.)	509	3.64	998	7.14
Missing	2,394	17.14	4,715	33.76
Total	13,968	100	13,968	100

Procedures

The data were collected by the AAIDD's SISOnline software, an advanced web-based application system and the process to obtain IRB approval was secured. The SISOnline software was designed to enable online data entry for the SIS. This system can be utilized by states, counties, or large organizations as well as smaller organizations or individual users. Users login at the AAIDD website (www.siswebsite.org) and electronically input data pertaining to the 85 items listed in the assessment. After data entry, users can obtain comprehensive information about the assessment, including raw scores, standard scores, a percentile ranking, and a graphic profile of support needs measured by the SIS-A. For users' convenience, results are universally and instantly accessible in PDF or HTML formats and are protected by passwords and regular data backups. The aggregated results collected by this system can be used for multiple purposes, including supports planning, systems planning, or resource allocation. Each person's personal information is fully protected by compliance with the U.S. Health Insurance Portability and Accountability Act of 1996 (HIPPA, 1996) and no personally identifying data were downloaded by the researchers in this study.

As Thompson et al. (2008) emphasized in their study findings, the accurate administration of the SIS and corresponding training are vital in measuring support needs of people with intellectual disability or related developmental disabilities. In this study, trainers who were certified by AAIDD provided onsite staff training before administering interviews. A qualified interviewer completed the SISOnline after having semi-structured interviews with at least two respondents. The interviewer was a trained person who had at least a bachelor's degree and several years of working experience with people with intellectual or closely related developmental disabilities. One of the main responsibilities of interviewers was to reach final

agreements when interview responses did not match. Respondents had known the person with intellectual disability for more than three months and had recently observed the person being rated in one or more circumstances for at least a couple of hours per setting. The interview process was in accordance with following four key instructions as described in the *SIS User Manual*;

1. This scale should be completed without regard to the services or supports currently provided or available.
2. Scores should reflect supports that would be necessary for this person to be successful in the activity.
3. If an individual uses assistive technology, the person should be rated with said technology in place.
4. Raters should complete all items, even if the person is not currently performing a listed activity (Thompson et al., 2004b, p. 25).

Measurement

The SIS-A was developed to measure the pattern and intensity of the support needs of people with intellectual disability aged 16 to 64. Specifically, the instrument is comprised of 49 items that measure support needs across six life activities: Home Living, Community Living, Lifelong Learning, Employment, Health and Safety, and Social activities. Scores from these six domains are used to calculate a SIS Support Needs Index (i.e., composite standard score) to present a comprehensive indication of the intensity of an individual's support needs in respect to the standardization sample (Thompson et al., 2004b). The SIS-A also includes eight items of Protection and Advocacy related activities, along with 15 medical and 13 behavioral conditions that are necessary when considering individuals' overall support needs.

Support needs in the Support Needs Index section are determined by three measures of support needs: (a) frequency, (b) daily support time, and (c) type of support. First, frequency is related to how often support is required for each targeted activity. Frequency is mainly rated on a 0 to 4 scale as a higher score indicates greater support needs (0 = *none or less than monthly*; 1 = *at least once a month, but not once a week*; 2 = *at least once a week, but not once a day*; 3 = *at least once a day, but not once an hour*; and 4 = *hourly or more frequently*). Some items, however, are evaluated by either 0 to 3 levels or 0 to 2 levels within the 0 to 4 scale, due to unique features that particular items are asking; those items are indicated with cross-out squares in the instrument. Second, daily support time (DST) examines the amount of time needed to support provision when the support is offered. Similar to the frequency, DST is evaluated on a 0 to 4 scale with exceptions of three items that cannot be measured with 0 to 4 levels (0 = *none*; 1 = *less than 30 minutes*; 2 = *30 minutes to less than 2 hours*; 3 = *2 hours to less than 4 hours*; and 4 = *4 hours or more*). Third, the type of support identifies the nature of support that a person needs to engage in the activity in question. The type of support is also rated by a 0 to 4 scale without any items excepted (0 = *none*; 1 = *monitoring*; 2 = *verbal/gestural prompting*; 3 = *partial physical assistance*; and 4 = *full physical assistance*). Exceptional medical and behavioral support needs are rated based on a 0 to 2 scale (0 = *no support needed*; 1 = *some support needed*; and 2 = *extensive support needed*). Appendix B shows expanded item descriptions for the SIS for Adults, along with initial descriptions that are provided in the *SIS User Manual*.

Analytic Procedures

Structural equation modeling (SEM) was used to address research questions. SEM allows researchers to analyze both observed and latent variables, determine the fit of the data to

models, and compare cross-group similarities or differences among latent variables. SEM incorporates both measurement and structural models. Measurement models examine the relationships among observed variables and underlying factors and structural models represent the relationships among underlying latent factors. Mplus version 7.0 (Muthén & Muthén, 2012) was used to run data in this study.

Pre-modeling steps. Prior to SEM analyses, data screening and data preparation were completed. This procedure involved rescaling variables and parceling. Missing data analysis was omitted because there was no missing data found after the creation of parcels for each construct. First, rescaling variables was performed because levels to measure support needs in the SIS-A vary from a 0 to 4 level to a 0 to 2 level within the 0 to 4 scale, depending on the nature of items. Proportion of maximum scoring (POMS) was used to transform variables without any change in the shape of the distribution or the strength of an association between any of the variables, by placing the original scale on a metric that is relatively more interpretable in the analysis (Little, 2013). POMS was computed by (the observed score for each question – the minimum possible score on the SIS for Adults)/(the maximum possible score on the SIS for Adults – the minimum possible score on the SIS for Adults) (Cohen, Cohen, Aiken, & West, 1999). Converted values ranged from zero to one.

Second, a parcel is defined as "an aggregate-level indicator comprised of the sum (or average) of two or more items, responses, or behaviors" (Little, Cunningham, Shahar, & Widaman, 2002, p. 152). The advantages of models based on parceled data over item-level analyses have been consistently addressed in the literature, including higher reliability, greater communality, lower likelihood of distributional violations, fewer parameter estimates, lower changes for correlated residuals or dual loadings of indicators, and reduced sources of sampling

error (Little, 2013). To create parcels, the item-to-construct balancing technique was utilized after averaging ratings across three dimensions of the SIS for Adults for each item (i.e., frequency, daily support time, and type of support). Created parcels served as manifest variables for each latent construct: Home Living Activities (HLA), Community Living Activities (CLA), Lifelong Learning Activities (LLA), Employment Activities (EA), Health and Safety Activities (HSA), Social Activities (SA), and Protection and Advocacy Activities (PAA). Means, standard deviations, and correlations among created parcels within each group (i.e., the higher medical support-need group, the lower medical support-need group, the higher behavioral support-need group, and the lower behavioral support-need group) are provided in Appendix C.

Data analyses. For the first main research question, a collapsed group was created to identify the impact of age and gender on support needs of adolescents and young adults with intellectual disability. For the main research questions two to five, two respective groups were created based on the levels of exceptional support needs (SN) as follows:

- Main research question 2: Higher Medical SN vs. Lower Medical SN
- Main research question 3: Higher Behavioral SN vs. Lower Behavioral SN
- Main research question 4: Higher Medical SN vs. Higher Behavioral SN
- Main research question 5: Lower Medical SN vs. Lower Behavioral SN

To evaluate the construct comparability and mean level differences in support-need constructs between individuals from different sub-groups, a series of tests were conducted. To start with, a test of the measurement model that indicates relationships between manifest variables (i.e., parcels) and seven latent constructs was conducted. The hypothesized measurement model is shown in Figure 4. Then, measurement invariance tests were performed to provide a basis to examine possible latent mean differences across the two groups in a

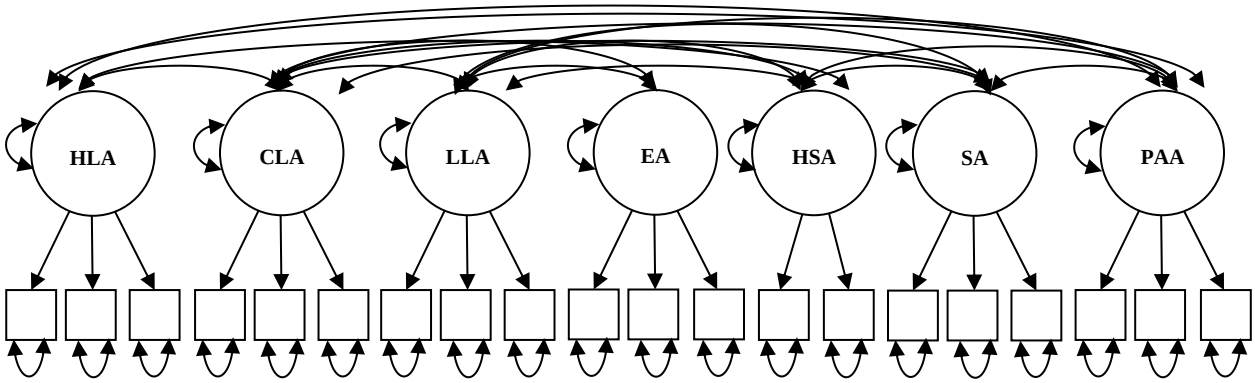


Figure 4. Hypothesized measurement model of the SIS for Adults. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA= social activities; and PAA = protection and advocacy activities.

meaningful way (Little, 1997). Measurement invariance tests included configural, weak, and strong invariance testing; (a) configural invariance is established by indicating the same pattern of fixed and freed parameters for each group; (b) weak invariance is established by constraining corresponding factor loadings for each construct equal across each group; and (c) strong invariance is established by equating the corresponding intercepts across each group to examine the observed means and estimated intercepts of indicators (Brown, 2006; Little, 2013). To set the scale, the effects-coding method was used to estimate each construct's latent variance in a non-arbitrary metric (Little, Slegers, & Card, 2006). That is, the average of parcel's loadings was equal to 1.0 by having the scaling constraint placed on a factor loading, instead of fixing the latent variance as 1.0 (i.e., fixed factor method) or fixing one factor loading as 1.0 (i.e., marker variable method), to provide unbiased information among parcels within each construct.

After obtaining strong invariance between two groups, population heterogeneity tests were performed to examine latent construct parameters. Population heterogeneity tests involve equality of factor variance/covariance matrices and equality of latent means in each group. The

equality of factor variances and covariances was tested with a chi-square difference test by setting the strong invariance model as a baseline model. Similarly, the equality of latent means was tested to examine potential mean differences across groups using chi-square difference tests by keeping the strong invariance model as a baseline model. The effects-coding method was also used to set the average of intercepts to be equal to 0 in order to interpret results more meaningfully (Little, 2013). Furthermore, the hypothesized structural model was tested to examine potential causal relationships between age and each of the latent constructs. Gender was also included in this hypothesized structural model as an exogenous variable to test its impact on each construct. The aforementioned series of steps from the measurement model to the structural model were conducted four times to address each main research question. Although it was not a major research question, chi-square difference tests were also conducted to explore how age and gender impacts differently on each construct depending on characteristics of groups.

For the last main research question, correlations among latent constructs in the *Support Needs Index Scale* (i.e., HLA, CLA, LLA, EA, HSA, and SA) and a latent construct in the *Supplemental Protection and Advocacy Scale* (i.e., PAA) were identified. Furthermore, the hypothesized structural model was tested to examine causal relationships among latent constructs by analyzing the degree to which each of the latent constructs predicts a higher-order support needs. The hypothesized structural model that represents relationships among latent constructs is presented in Figure 5.

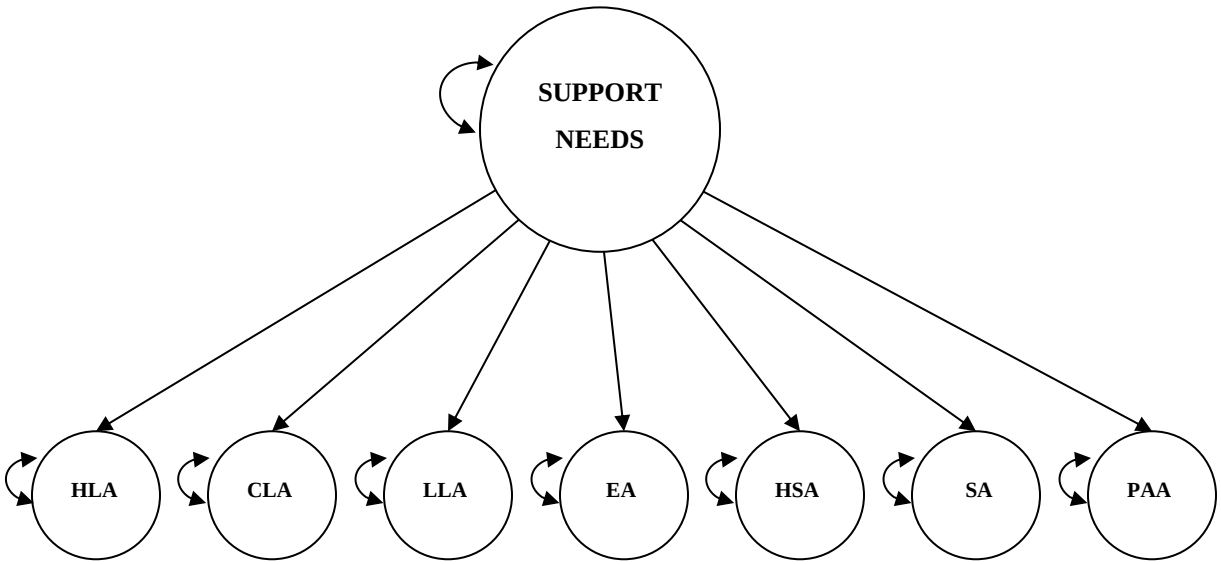


Figure 5. Hypothesized structural model of the SIS for Adults. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Results

Main Research Question One

The SEM model for a collapsed group demonstrated good fit, χ^2 (175) = 9357.046, CFI = .973, TLI = .964, RMSEA = .061 $_{(.060\text{-}.062)}$, and SRMR = .022. As seen in Table 3, age significantly predicts each support need of individuals with intellectual disability. As people get older, they tend to have fewer support needs. The construct that was most sensitive to age variable was Home Living Activities (γ = -.109, z = -24.209, p < .001). Social Activities (γ = -.100, z = -22.021, p < .001), Community Living Activities (γ = -.095, z = -21.047, p < .001), Health and Safety Activities (γ = -.091, z = -20.019, p < .001), Employment Activities (γ = -.079, z = -17.711, p < .001), Lifelong Learning Activities (γ = -.074, z = -16.231, p < .001), Protection and Advocacy Activities (γ = -.072, z = -15.860, p < .001) are listed in the descending order of age gamma impact. As seen in Table 4, the impact of gender on support needs varied depending

on each support need domain. Only Social Activities ($\gamma = .095$, $z = 5.226$, $p < .001$), Employment Activities ($\gamma = .084$, $z = 4.680$, $p < .001$), Lifelong Learning Activities ($\gamma = .080$, $z = 4.382$, $p < .001$), and Protection and Advocacy Activities ($\gamma = .062$, $z = 3.388$, $p < .001$) have gender differences. The positive gamma weights represent that males tend to have more support needs than females do.

Table 3

Gamma Weights of Age on the Latent Constructs (Single Group)

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
HLA	-0.109 (0.004)	-24.209	0.000	-0.209
CLA	-0.095 (0.005)	-21.047	0.000	-0.183
LLA	-0.074 (0.005)	-16.231	0.000	-0.143
EA	-0.079 (0.004)	-17.711	0.000	-0.153
HSA	-0.091 (0.005)	-20.019	0.000	-0.177
SA	-0.100 (0.005)	-22.021	0.000	-0.192
PAA	-0.072 (0.005)	-15.860	0.000	-0.140

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 4

Gamma Weights of Gender (0 = Female 1= Male) on the Latent Constructs (Single Group)

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
HLA	0.017 (0.018)	0.942	0.346	0.008
CLA	0.024 (0.018)	1.334	0.182	0.012
LLA	0.080 (0.018)	4.382	0.000	0.038
EA	0.084 (0.018)	4.680	0.000	0.040
HSA	-0.015 (0.018)	-0.804	0.421	-0.007
SA	0.095 (0.018)	5.226	0.000	0.045
PAA	0.062 (0.018)	3.388	0.001	0.030

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Main Research Question Two

Measurement model for each group. The CFA model for each group demonstrated good fit, χ^2 (149) = 3771.745, CFI = .967, TLI = .957, RMSEA = .067 $_{(.065\text{-}.069)}$, and SRMR=.030 for the higher medical support-need group and χ^2 (149) = 5215.299, CFI = .974, TLI = .967, RMSEA = .063 $_{(.062\text{-}.065)}$, and SRMR=.022 for the lower medical support-need group, respectively.

Testing measurement parameters. Measurement parameter comparison includes configural invariance, weak invariance, and strong invariance. The configural invariance model was acceptable based on the following fit indices: χ^2 (298) = 8987.043, CFI = .972, TLI = .964, and RMSEA = .065 $_{(.063 - .066)}$, indicating that people with higher and lower medical support needs have the same pattern of fixed and freed parameters for each support-need construct measured by the SIS for Adults. The weak factorial invariance was also established based on the CFI criterion, indicating the factor loadings of each construct are identical across the two groups. Δ CFI that is less than .01 leads to the conclusion of tenable invariance (Cheung & Rensvold,

2002). Lastly, the strong invariance model was tenable based on the same CFI criterion used for determining the tenability of the weak invariance model. Table 5 displays fit indices for the nested sequences to identify measurement invariances. The loading and intercept values, residuals, and R^2 values for each parcel, as well as the estimated latent variances from the strong invariance model are presented in Table 6.

Table 5

Fit Indices for the Nested Sequence in the Two-Group CFA (Medical Support-Need Groups)

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	RMSEA	RMSEA 90% CI	CFI	TLI	Constraint Tenable
Null Model	314171.808	372	.00	---	---	---	---	---	---	---	---
Configural Invariance[1]	8987.043	298	.00	---	---	---	0.065	0.063-0.066	0.972	0.964	---
Weak Invariance[1]	10143.739	311	.00	---	---	---	0.067	0.066-0.068	0.968	0.961	Yes
Strong Invariance[1]	10908.624	324	.00	---	---	---	0.068	0.067-0.069	0.965	0.959	Yes
With age and gender[1]	11249.808	376	.00	---	---	---	0.064	0.063-0.065	0.965	0.967	Yes
With sig. paths[1]	11324.150	384	.00	---	---	---	0.064	0.063-0.065	0.964	0.957	Yes
Homogeneity of Var/Cov[2]	12539.221	352	.00	1630.597	28	<.0001	---	---	---	---	No
Latent Mean Invariance[2]	15429.087	331	.00	4520.463	7	<.0001	---	---	---	---	No
With sig. paths[2]	11360.193	391	.00	36.043	7	<.0001	---	---	---	---	No

Note. Each nested model contains its constrains, plus the constraints of all previous, tenable models.
[1] Evaluated with RMSEA and CFI Model Test
[2] Evaluated with χ^2 Difference Test

Table 6

Loading and Intercept Values, Residuals, and R^2 Values for Each Parcel, and the Estimated Latent Variances

	Equated Estimates		Standardized		
Indicator	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Home Living Activities (HIGH): Estimated Latent Variance = 0.021					
Parcel 1	0.966 (0.003)	0.072 (0.002)	0.914	0.164	0.836
Parcel 2	0.988 (0.003)	0.002 (0.002)	0.901	0.187	0.813
Parcel 3	1.046 (0.003)	-0.074 (0.002)	0.864	0.253	0.747
Home Living Activities (LOW) : Estimated Latent Variance = 0.038					
Parcel 1	0.966 (0.003)	0.072 (0.002)	0.903	0.185	0.815
Parcel 2	0.988 (0.003)	0.002 (0.002)	0.915	0.162	0.838
Parcel 3	1.046 (0.003)	-0.074 (0.002)	0.897	0.196	0.804
Community Living Activities (HIGH) : Estimated Latent Variance = 0.011					
Parcel 1	1.115 (0.004)	-0.057 (0.002)	0.890	0.208	0.792
Parcel 2	0.890 (0.003)	0.116 (0.002)	0.866	0.250	0.750
Parcel 3	0.995 (0.004)	-0.059 (0.002)	0.799	0.362	0.638
Community Living Activities (LOW) : Estimated Latent Variance = 0.026					
Parcel 1	1.115 (0.004)	-0.057 (0.002)	0.924	0.147	0.853
Parcel 2	0.890 (0.003)	0.116 (0.002)	0.894	0.200	0.800
Parcel 3	0.995 (0.004)	-0.059 (0.002)	0.871	0.241	0.759
Lifelong Learning Activities (HIGH) : Estimated Latent Variance = 0.017					
Parcel 1	1.047 (0.004)	-0.063 (0.003)	0.868	0.247	0.753
Parcel 2	0.988 (0.004)	0.006 (0.002)	0.894	0.201	0.799
Parcel 3	0.965 (0.004)	0.057 (0.002)	0.898	0.194	0.806
Lifelong Learning Activities (LOW) : Estimated Latent Variance = 0.023					
Parcel 1	1.047 (0.004)	-0.063 (0.003)	0.865	0.251	0.749
Parcel 2	0.988 (0.004)	0.006 (0.002)	0.888	0.212	0.788
Parcel 3	0.965 (0.004)	0.057 (0.002)	0.887	0.213	0.787
Employment Activities (HIGH): Estimated Latent Variance = 0.029					
Parcel 1	1.095 (0.003)	-0.076 (0.002)	0.946	0.105	0.895
Parcel 2	0.872 (0.003)	0.050 (0.002)	0.931	0.134	0.866
Parcel 3	1.032 (0.004)	0.026 (0.003)	0.865	0.251	0.749

	Equated Estimates		Standardized		
Indicator	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Employment Activities (LOW) : Estimated Latent Variance = 0.035					
Parcel 1	1.095 (0.003)	-0.076 (0.002)	0.929	0.137	0.863
Parcel 2	0.872 (0.003)	0.050 (0.002)	0.932	0.131	0.869
Parcel 3	1.032 (0.004)	0.026 (0.003)	0.826	0.317	0.683
Health and Safety Activities (HIGH) : Estimated Latent Variance = 0.015					
Parcel 1	1.018 (0.003)	-0.055 (0.002)	0.877	0.231	0.769
Parcel 2	0.982 (0.003)	0.055 (0.002)	0.887	0.213	0.787
Health and Safety Activities (LOW) : Estimated Latent Variance = 0.024					
Parcel 1	1.018 (0.003)	-0.055 (0.002)	0.911	0.170	0.830
Parcel 2	0.982 (0.003)	0.055 (0.002)	0.884	0.219	0.781
Social Activities (HIGH) : Estimated Latent Variance = 0.027					
Parcel 1	0.974 (0.003)	-0.003 (0.002)	0.876	0.233	0.767
Parcel 2	0.929 (0.003)	0.055 (0.002)	0.878	0.229	0.771
Parcel 3	1.097 (0.004)	-0.053 (0.002)	0.866	0.250	0.750
Social Activities (LOW) : Estimated Latent Variance = 0.040					
Parcel 1	0.974 (0.003)	-0.003 (0.002)	0.912	0.169	0.831
Parcel 2	0.929 (0.003)	0.055 (0.002)	0.904	0.184	0.816
Parcel 3	1.097 (0.004)	-0.053 (0.002)	0.899	0.192	0.808
Protection and Advocacy Activities (HIGH) : Estimated Latent Variance = 0.017					
Parcel 1	0.884 (0.003)	0.075 (0.002)	0.886	0.215	0.785
Parcel 2	0.848 (0.004)	0.045 (0.002)	0.858	0.264	0.736
Parcel 3	1.267 (0.004)	-0.120 (0.003)	0.851	0.275	0.725
Protection and Advocacy Activities (LOW) : Estimated Latent Variance = 0.023					
Parcel 1	0.884 (0.003)	0.075 (0.002)	0.903	0.185	0.815
Parcel 2	0.848 (0.004)	0.045 (0.002)	0.887	0.213	0.787
Parcel 3	1.267 (0.004)	-0.120 (0.003)	0.869	0.245	0.755

Testing latent parameters. Since measurement invariance models were tenable in our data, latent parameter tests that include equality of factor variances/covariances and the equality of latent means (also referred to as population heterogeneity tests) were possible to meaningfully

interpret latent relationships. First, as seen in Table 5, the equality of variances and covariances across the two groups was not tenable based on the chi-square difference test using the strong invariance model as a baseline model ($\Delta\chi^2$ (28) = 1630.597, $p < .0001$). It is important to note that significant tests using chi-square different tests were determined by the .001 criterion throughout this study, instead of the .05 criterion, due to the chi-square test's sensitivity to sample size (Brannick, 1995; Kelloway, 1995). The untenable result from the variances-covariances test indicates that the relations among latent variables are significantly different within and between groups (Little, 2013). Thus, different SEM models for two groups were tested to estimate the effects of age and gender on each support need construct. The structural model that includes both age and gender variables demonstrated good model fit (χ^2 (376) = 11249.808, $p <.001$, CFI = .965, TLI = .957, and RMSEA = .064 $_{(.063 - .065)}$).

To identify separate impacts of age and gender on support needs, additional tests were followed. As seen in Table 7, age significantly predicts each support need in both higher and lower medical-need groups. As individuals get older, they tend to have lower levels of all support needs. Specifically, the construct that was most influenced by age was Home Living Activities in both groups (γ = -.052, z = -7.312, $p < .001$ for the higher medical support-need group, γ = -.137, z = -17.352, $p < .001$ for the lower medical support-need group). Social Activities and Community Living Activities were the second and third constructs that were sensitive to the age variable. In testing the degree to which these gamma weights are significantly different across the two groups, nested chi-square tests using the structural model that includes both age and gender variables as a baseline model were conducted. As seen in Table 8, the degrees to which age influences support needs significantly differed across the two groups, with the exception of the Lifelong Learning Activities (HLA: $\Delta\chi^2$ (1) = 66.569,

Table 7

Gamma Weights Indicating the Impact of Age on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Higher Medical Support-Need Group				
HLA	-0.052 (0.007)	-7.312	0.000	-0.103
CLA	-0.046 (0.007)	-6.366	0.000	-0.091
LLA	-0.043 (0.007)	-6.012	0.000	-0.085
EA	-0.033 (0.007)	-4.737	0.000	-0.066
HSA	-0.031 (0.007)	-4.327	0.000	-0.063
SA	-0.050 (0.007)	-7.013	0.000	-0.100
PAA	-0.030 (0.007)	-4.147	0.000	-0.059
Lower Medical Support-Need Group				
HLA	-0.137 (0.008)	-17.352	0.000	-0.194
CLA	-0.136 (0.009)	-14.935	0.000	-0.168
LLA	-0.074 (0.007)	-10.640	0.000	-0.121
EA	-0.089 (0.006)	-13.812	0.000	-0.154
HSA	-0.107 (0.008)	-14.049	0.000	-0.161
SA	-0.120 (0.007)	-16.610	0.000	-0.186
PAA	-0.082 (0.007)	-11.919	0.000	-0.135

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

$p < .0001$; CLA: $\Delta\chi^2$ (1) = 61.7, $p < .0001$; LLA: $\Delta\chi^2$ (1) = 9.853, $p > .0001$; EA: $\Delta\chi^2$ (1) = 35.222, $p < .0001$; HSA: $\Delta\chi^2$ (1) = 52.369, $p < .0001$; SA: $\Delta\chi^2$ (1) = 48.693, $p < .0001$; and PAA: $\Delta\chi^2$ (1) = 27.987, $p < .0001$). That is, individuals in the lower medical support-need group tend to have the greater degrees to which support needs decrease as they become older. Gender, however, had different patterns between the two groups. As seen in Table 9, the higher medical needs group did not have gender differences, whereas the lower medical need group was influenced by gender with an exception of Health and Safety Activities. The positive gamma weights in the lower support-need group represent that males tend to have more support needs than females do.

Second, the equality of latent means was tested including the significant age and gender paths as covariates in the model to control for their impacts on the latent constructs. Then the nested chi-square test was conducted by setting the strong invariance model that includes significant age and gender effects as a baseline model. This is because findings from the structural model showed that age and some of the gender paths significantly predict levels of support needs measured by the SIS-A (see Table 7 and Table 9). The equality of latent means across two groups was not established, as shown in Table 5, $\Delta \chi^2$ (7) = 36.043, $p < .0001$. The result from this omnibus latent mean invariance test supports that individuals in two different groups tend to have unequal levels of support needs. Thus, it was logical to test follow-up individual mean-level comparisons to determine where the differences originated. As seen in Table 10, the results from the nested chi-square tests, which set the omnibus latent mean model as a baseline model, showed that Lifelong Learning Activities have the different mean level between the two groups ($\Delta \chi^2$ (1) = 22.813, $p < .0001$). Specifically, participants with lower medical support needs tend to have the greater support needs in the area of Lifelong Learning Activities than participants with higher medical support needs (Table 11). The effect size (d = 0.613) indicated the medium magnitude of the latent mean difference in the Lifelong Learning Activities (Cohen, 1988).

Table 8

Tests of Gamma Weights Indicating the Impact of Age across the Two Groups

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Structural model[1]	11249.808	376	.00	---	---	---	---
HLA	11316.377	377	.00	66.569	1	< 0.001	No
CLA	11311.508	377	.00	61.7	1	< 0.001	No
LLA	11259.661	377	.00	9.853	1	> 0.001	Yes
EA	11285.030	377	.00	35.222	1	< 0.001	No
HSA	11302.177	377	.00	52.369	1	< 0.001	No
SA	11298.501	377	.00	48.693	1	< 0.001	No
PAA	11277.795	377	.00	27.987	1	< 0.001	No

Note. [1] Structural model with age and gender variables (baseline model); HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 9

Gamma Weights Indicating the Impact of Gender (0=Female 1=Male) on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Higher Medical Support-Need Group				
HLA	-0.066 (0.029)	-2.274	0.023	-0.032
CLA	-0.032 (0.029)	-1.091	0.275	-0.016
LLA	0.051 (0.029)	1.745	0.081	0.025
EA	0.043 (0.029)	1.491	0.136	0.021
HSA	-0.093 (0.030)	-3.136	0.002	-0.045
SA	0.052 (0.029)	1.777	0.075	0.025
PAA	0.007 (0.029)	0.232	0.817	0.003
Lower Medical Support-Need Group				
HLA	0.129 (0.031)	4.241	0.000	0.047
CLA	0.119 (0.035)	3.377	0.001	0.037
LLA	0.140 (0.027)	5.199	0.000	0.059
EA	0.144 (0.025)	5.771	0.000	0.064
HSA	0.076 (0.029)	2.584	0.010	0.029
SA	0.181 (0.028)	6.466	0.000	0.071
PAA	0.131 (0.027)	4.921	0.000	0.055

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 10

Tests of the Latent Means (Medical Support-Need Groups)

Model	χ^2	*df*	*P*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable	Effect Size[1]
Strong Invariance with significant paths (Baseline Model)	11324.150	384	.00	---	---	---	---	---
Latent Mean Invariance with sig. paths	11360.193	391	.00	36.043	7	<.0001	No	---
Home Living Activities	11359.849	390	.00	0.344	1	0.573	Yes	---
Community Living Activities	11353.120	390	.00	7.073	1	0.004	Yes	---
Lifelong Learning Activities	11337.380	390	.00	22.813	1	0.000	No	0.613
Employment Activities	11355.677	390	.00	4.516	1	0.020	Yes	---
Health and Safety Activities	11360.133	390	.00	0.06	1	1.581	Yes	---
Social Activities	11358.159	390	.00	2.034	1	0.101	Yes	---
Protection and Advocacy Activities	11358.701	390	.00	1.492	1	0.155	Yes	---

Note. [1] Effect size is latent *d*, where $d = (\alpha_2-\alpha_1)/\sqrt{\frac{(n_1 * \psi_1 + n_2 * \psi_2)}{n_1 + n_2}}$; α_2 and α_1 are the estimated means in latent variable metric; n_2 and n_1 are the sample size for each group; ψ_2 and ψ_1 are the estimated latent variances of the distributions around the latent means of α_2 and α_1, respectively. χ^2 = chi-square value; *df* = degrees of freedom; *p* = *p* value; $\Delta\chi^2$ = changes in chi-square values.

Table 11

Estimated Latent Means (Medical Support-Need Groups)

	Higher Support-Need Group		Lower Support-Need Group	
Constructs	*M*	*SE*	*M*	*SE*
Lifelong Learning Activities	4.528	0.061	4.651	0.059

Note. Unstandardized values are presented.

Main Research Question Three

Measurement model for each group. The CFA model for each group demonstrated good fit, χ^2 (149) = 4254.519, CFI = .968, TLI = .959, RMSEA = .065 $_{(.063\text{-}.067)}$, SRMR=.029 for the higher behavioral support-need group and χ^2 (149) = 5273.148, CFI = .972, TLI = .965, RMSEA = .068 $_{(.066\text{-}.070)}$, SRMR=.023 for the lower behavioral support-need group, respectively.

Testing measurement parameters. The procedures to test measurement parameters were performed in the same manner described in the preceding medical support-need group section. The configural invariance model demonstrated good model fit indices: χ^2 (298) = 9527.666, CFI = .970, TLI = .962, and RMSEA = .067 $_{(.065 - .068)}$, indicating that people in both higher and lower behavioral support-need groups have the same pattern of fixed and freed parameters for each support-need construct. In addition, both weak and strong invariance models were established based on the CFI criterion (i.e., ΔCFI < .01), suggesting that corresponding factor loadings and intercepts are equivalent across the two groups. Table 12 shows fit indices for the nested sequences to determine measurement invariances. The loading and intercept values, residuals, R^2 values for each parcel, as well as the estimated latent variances from the strong invariance model are presented in Table 13.

Table 12

Fit Indices for the Nested Sequence in the Two-Group CFA (Behavioral Support-Need Groups)

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	RMSEA	RMSEA 90% CI	CFI	TLI	Constraint Tenable
Null Model	305683.689	372	.00	---	---	---	---	---	---	---	---
Configural Invariance[1]	9527.666	298	.00	---	---	---	0.067	.065 - .068	.970	.962	---
Weak Invariance[1]	9912.297	311	.00	---	---	---	0.066	.065 - .068	.969	.962	Yes
Strong Invariance[1]	10444.466	324	.00	---	---	---	0.067	.066 - .068	.967	.962	Yes
With age and gender[1]	10723.159	376	.00	---	---	---	0.063	.062 - .064	.967	.959	Yes
With sig. paths (age) [1]	10648.490	350	.00	---	---	---	0.065	.064 - .066	.967	.960	Yes
Homogeneity of Var/Cov[2]	11914.420	352	.00	1469.954	28	<.0001	---	---	---	---	No
Latent Mean Invariance[2]	12538.431	331	.00	2093.965	7	<.0001	---	---	---	---	No
With sig. paths (age) [2]	10687.705	357	.00	39.215	7	<.0001	---	---	---	---	No

Note. Each nested model contains its constrains, plus the constraints of all previous, tenable models.
[1] Evaluated with RMSEA and CFI Model Test
[2] Evaluated with χ^2 Difference Test

Table 13

Loading and Intercept Values, Residuals, and R^2 Values for Each Parcel, and the Estimated Latent Variances

	Equated Estimates		Standardized		
Indicator	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Home Living Activities (HIGH): Estimated Latent Variance = 0.028					
Parcel 1	0.976 (0.003)	1.045 (0.001)	0.918	0.158	0.842
Parcel 2	0.983 (0.003)	0.986 (0.001)	0.908	0.176	0.824
Parcel 3	1.040 (0.003)	0.968 (0.002)	0.876	0.232	0.768
Home Living Activities (LOW) : Estimated Latent Variance = 0.049					
Parcel 1	0.976 (0.003)	1.045 (0.001)	0.929	0.137	0.863
Parcel 2	0.983 (0.003)	0.986 (0.001)	0.935	0.125	0.875
Parcel 3	1.040 (0.003)	0.968 (0.002)	0.921	0.152	0.848
Community Living Activities (HIGH) : Estimated Latent Variance = 0.014					
Parcel 1	1.117 (0.004)	1.060 (0.002)	0.908	0.175	0.825
Parcel 2	0.893 (0.003)	1.007 (0.001)	0.878	0.230	0.770
Parcel 3	0.990 (0.004)	0.933 (0.002)	0.817	0.333	0.667
Community Living Activities (LOW) : Estimated Latent Variance = 0.028					
Parcel 1	1.117 (0.004)	1.060 (0.002)	0.929	0.137	0.863
Parcel 2	0.893 (0.003)	1.007 (0.001)	0.904	0.182	0.818
Parcel 3	0.990 (0.004)	0.933 (0.002)	0.884	0.219	0.781
Lifelong Learning Activities (HIGH) : Estimated Latent Variance = 0.014					
Parcel 1	1.045 (0.004)	0.983 (0.002)	0.863	0.255	0.745
Parcel 2	0.990 (0.004)	0.994 (0.001)	0.867	0.249	0.751
Parcel 3	0.965 (0.004)	1.022 (0.001)	0.870	0.243	0.757
Lifelong Learning Activities (LOW) : Estimated Latent Variance = 0.026					
Parcel 1	1.045 (0.004)	0.983 (0.002)	0.868	0.246	0.754
Parcel 2	0.990 (0.004)	0.994 (0.001)	0.902	0.187	0.813
Parcel 3	0.965 (0.004)	1.022 (0.001)	0.900	0.190	0.810
Employment Activities (HIGH): Estimated Latent Variance = 0.025					
Parcel 1	1.096 (0.003)	1.021 (0.001)	0.944	0.110	0.890
Parcel 2	0.869 (0.003)	0.921 (0.001)	0.919	0.155	0.845
Parcel 3	1.036 (0.004)	1.058 (0.002)	0.853	0.272	0.728

	Equated Estimates		Standardized		
Indicator	Loading (SE)	Intercept (SE)	Loading	Theta	R^2
Employment Activities (LOW) : Estimated Latent Variance = 0.039					
Parcel 1	1.096 (0.003)	1.021 (0.001)	0.932	0.132	0.868
Parcel 2	0.869 (0.003)	0.921 (0.001)	0.937	0.122	0.878
Parcel 3	1.036 (0.004)	1.058 (0.002)	0.834	0.304	0.696
Health and Safety Activities (HIGH) : Estimated Latent Variance = 0.016					
Parcel 1	1.009 (0.003)	0.958 (0.001)	0.872	0.239	0.761
Parcel 2	0.991 (0.003)	1.042 (0.001)	0.880	0.225	0.775
Health and Safety Activities (LOW) : Estimated Latent Variance = 0.032					
Parcel 1	1.009 (0.003)	0.958 (0.001)	0.927	0.141	0.859
Parcel 2	0.991 (0.003)	1.042 (0.001)	0.913	0.166	0.834
Social Activities (HIGH) : Estimated Latent Variance = 0.021					
Parcel 1	0.974 (0.003)	0.971 (0.002)	0.862	0.257	0.743
Parcel 2	0.926 (0.003)	0.983 (0.002)	0.855	0.269	0.731
Parcel 3	1.100 (0.004)	1.046 (0.002)	0.846	0.285	0.715
Social Activities (LOW) : Estimated Latent Variance = 0.045					
Parcel 1	0.974 (0.003)	0.971 (0.002)	0.915	0.163	0.837
Parcel 2	0.926 (0.003)	0.983 (0.002)	0.907	0.178	0.822
Parcel 3	1.100 (0.004)	1.046 (0.002)	0.908	0.176	0.824
Protection and Advocacy Activities (HIGH) : Estimated Latent Variance = 0.015					
Parcel 1	0.884 (0.003)	0.959 (0.002)	0.870	0.244	0.756
Parcel 2	0.848 (0.004)	0.894 (0.002)	0.841	0.293	0.707
Parcel 3	1.268 (0.004)	1.147 (0.002)	0.825	0.319	0.681
Protection and Advocacy Activities (LOW) : Estimated Latent Variance = 0.025					
Parcel 1	0.884 (0.003)	0.959 (0.002)	0.910	0.171	0.829
Parcel 2	0.848 (0.004)	0.894 (0.002)	0.895	0.198	0.802
Parcel 3	1.268 (0.004)	1.147 (0.002)	0.881	0.223	0.777

Testing latent parameters. Given the fact that measurement invariance models were established, it was possible to meaningfully compare latent parameters. Latent parameter tests were performed to determine the equality of variances/covariances and the equality of latent means. As seen in Table 12, the equality of variances and covariances across the two groups was not supported as evidenced by the nested chi-square difference test using the strong invariance model as a baseline model ($\Delta \chi^2$ (28) = 1469.954, $p < .0001$). This means that the relationship of the latent constructs between the groups are significantly different, which generated the need to run two different SEM models to evaluate the effects of age and gender on constructs for each group (Little, 2013). The .001 significance criterion was used instead of the traditional .05 criterion because of the large sample size used in this study (n = 13,968). The structural model that incorporates both age and gender indicated good model fit (χ^2 (376) = 10723.159, p <.001, CFI = .967, TLI = .959, and RMSEA = .063 $_{(.062 - .064)}$).

Individual follow-up tests were conducted to identify the respective impact of age and gender on support needs. As shown in Table 14, age significantly exercises its influence on each construct in both groups; that is, as people age, their support needs tend to decrease. The construct that was most influenced by age was Home Living Activities in both groups (γ = -.082, z = -12.394, $p < .001$ for the higher behavioral support-need group, γ = -.143, z = -17.145, $p < .001$ for the lower behavioral support-need group). Community Living Activities and Social Activities went after Home Living Activities in spite of different orders in each group. Chi-square difference tests, setting the structural model that keeps both age and gender variables as a baseline model, were performed to test the degrees to which these gamma weights are significantly different across the two groups. As seen in Table 15, the degrees to which age influences support needs significantly differed across the two groups, indicating that participants

with lower behavior support needs have less support needs as they get older compared with participants with higher behavioral support needs (HLA: $\Delta\chi^2$ (1) = 33.882, $p < .0001$; CLA: $\Delta\chi^2$ (1) = 37.737, $p < .0001$; LLA: $\Delta\chi^2$ (1) = 13.901, $p < .0001$; EA: $\Delta\chi^2$ (1) = 34.506, $p < .0001$; HSA: $\Delta\chi^2$ (1) = 55.311, $p < .0001$; SA: $\Delta\chi^2$ (1) = 54.938, $p < .0001$; and PAA: $\Delta\chi^2$ (1) = 34.38, $p < .0001$). Unlike the age variable, gender did not exert significant influences on support needs measured by the SIS for Adults (Table 16).

Table 14

Gamma Weights Indicating the Impact of Age on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Higher Behavioral Support-Need Group				
HLA	-0.082 (0.007)	-12.394	0.000	-0.158
CLA	-0.062 (0.007)	-9.366	0.000	-0.121
LLA	-0.047 (0.007)	-7.094	0.000	-0.092
EA	-0.041 (0.007)	-6.247	0.000	-0.079
HSA	-0.048 (0.007)	-7.116	0.000	-0.094
SA	-0.056 (0.007)	-8.316	0.000	-0.109
PAA	-0.031 (0.007)	-4.628	0.000	-0.061
Lower Behavioral Support-Need Group				
HLA	-0.143 (0.008)	-17.145	0.000	-0.203
CLA	-0.130 (0.009)	-14.663	0.000	-0.175
LLA	-0.088 (0.009)	-10.229	0.000	-0.123
EA	-0.100 (0.008)	-12.846	0.000	-0.153
HSA	-0.132 (0.009)	-14.571	0.000	-0.176
SA	-0.139 (0.009)	-15.338	0.000	-0.183
PAA	-0.093 (0.008)	-11.285	0.000	-0.136

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 15

Tests of Gamma Weights Indicating the Impact of Age across the Two Groups

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Structural model[1]	10723.159	376	0.00	---	---	---	---
HLA	10757.041	377	0.00	1	33.882	<.0001	No
CLA	10760.896	377	0.00	1	37.737	<.0001	No
LLA	10737.060	377	0.00	1	13.901	<.0001	No
EA	10757.665	377	0.00	1	34.506	<.0001	No
HSA	10778.470	377	0.00	1	55.311	<.0001	No
SA	10778.097	377	0.00	1	54.938	<.0001	No
PAA	10757.539	377	0.00	1	34.38	<.0001	No

Note. [1] Structural model with age and gender variables (baseline model); HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 16

Gamma Weights Indicating the Impact of Gender (0=Female 1=Male) on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Higher Behavioral Support-Need Group				
HLA	-0.041(0.027)	-1.508	0.132	-0.019
CLA	0.006 (0.027)	0.215	0.830	0.003
LLA	0.046 (0.028)	1.672	0.094	0.022
EA	0.043 (0.027)	1.597	0.110	0.020
HSA	-0.087 (0.028)	-3.107	0.002	-0.041
SA	0.044 (0.028)	1.592	0.111	0.021
PAA	0.009 (0.028)	0.310	0.756	0.004
Lower Behavioral Support-Need Group				
HLA	-0.005 (0.032)	-0.142	0.887	-0.002
CLA	-0.044 (0.034)	-1.291	0.197	-0.015
LLA	0.047 (0.033)	1.430	0.153	0.017
EA	0.062 (0.030)	2.050	0.040	0.024
HSA	-0.070 (0.035)	-2.022	0.043	-0.024
SA	0.057 (0.035)	1.640	0.101	0.019
PAA	0.032 (0.032)	1.006	0.314	0.012

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Additionally, the equality of latent means was tested by keeping age as a covariate in the model to control for its impact on latent constructs. As seen in Table 12, the chi-square test, using the strong invariance model that includes significant age paths as a baseline model, indicated the latent means across two groups are not identical ($\Delta \chi^2$ (7) = 39.215, p <.0001). The follow-up mean level comparisons were performed to identify which constructs have different mean levels across the two groups. As presented in Table 17, the results from the nested chi-square difference tests, setting the latent mean invariance model as a baseline model, showed that

Table 17

Tests of the Latent Means (Behavioral Support-Need Groups)

Model	χ^2	*df*	*P*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable	Effect Size[1]
Strong Invariance with Age (Baseline Model)	10648.490	350	.00	---	---	---	---	---
Latent Mean Invariance with Age	10687.705	357	.00	39.215	7	<.0001	No	---
Home Living Activities	10687.662	356	.00	0.043	1	1.883	Yes	---
Community Living Activities	10687.286	356	.00	0.419	1	0.500	Yes	---
Lifelong Learning Activities	10665.510	356	.00	22.195	1	0.000	No	0.585
Employment Activities	10685.240	356	.00	2.465	1	0.074	Yes	---
Health and Safety Activities	10677.133	356	.00	10.572	1	0.001	No	0.642
Social Activities	10687.697	356	.00	0.008	1	4.443	Yes	---
Protection and Advocacy Activities	10687.316	356	.00	0.389	1	0.527	Yes	---

Note. [1] Effect size is latent *d*, where $d = (\alpha_2-\alpha_1)/\sqrt{\frac{(n_1 * \psi_1 + n_2 * \psi_2)}{n_1 + n_2}}$; α_2 and α_1 are the estimated means in latent variable metric; n_2 and n_1 are the sample size for each group; ψ_2 and ψ_1 are the estimated latent variances of the distributions around the latent means of α_2 and α_1, respectively. χ^2 = chi-square value; *df* = degrees of freedom; *p* = *p* value; $\Delta\chi^2$ = changes in chi-square values.

Lifelong Learning Activities and Health and Safety Activities have different mean levels across two groups (LLA: $\Delta \chi^2$ (1) = 22.195, p <.0001; HSA: $\Delta \chi^2$ (1) = 10.572, p <.0001). The effect sizes were calculated to estimate the strengths of the latent mean differences across higher and lower behavioral support-need groups. Based on Cohen (1988)'s criterion that indicate small, medium, and large effect sizes as .20, .50, and .80 respectively, both constructs demonstrated medium effect sizes (LLA: d = 0.585, HSA: d = 0.642). As shown in Table 18, participants with higher behavioral support needs tend to have fewer support needs in the area of Lifelong Learning Activities than participants with lower behavioral support needs do. On the other hand, participants with higher behavioral support needs have more support needs in Health and Safety Activities compared with participants with lower behavioral support needs.

Table 18

Estimated Latent Means (Behavioral Support-Need Groups)

	Higher Support-Need Group		Lower Support-Need Group	
Constructs	*M*	*SE*	*M*	*SE*
Lifelong Learning Activities	5.322	0.059	5.336	0.058
Health and Safety Activities	4.486	0.052	4.453	0.051

Note. Unstandardized values are presented.

Main Research Question Four

Measurement model for each group. The CFA model for each group demonstrated good fit, χ^2 (149) = 3771.745, CFI = .967, TLI = .957, RMSEA = .067 $_{(.065\text{-}.069)}$, and SRMR=.030 for the higher medical support-need group and χ^2 (149) = 4254.519, CFI = .968, TLI = .959, RMSEA = .065 $_{(.063\text{-}.067)}$, and SRMR=.029 for the higher behavioral support-need group, respectively.

Testing measurement parameters. The steps to investigate measurement parameters were the same as described previously. The configural invariance model demonstrated good model fit indices: χ^2 (298) = 8026.263, CFI = .967, TLI = .958, and RMSEA = .066 $_{(.065 - .067)}$, representing that people in both higher medical support-need group and higher behavioral support-need group have an identical pattern of fixed and freed parameters for each support-need construct. As table 19 shows, weak and strong invariance were supported based on the CFI criterion (i.e., ΔCFI < .01), indicating that corresponding factor loadings and intercepts are identical across two groups. The loading and intercept values, residuals, R^2 values for each parcel, as well as the estimated latent variances from the strong invariance model are presented in Table 20.

Testing latent parameters. Since the measurement invariance models were tenable, we could meaningfully interpret the latent parameters. Latent parameter tests include the equality of variances/covariances and the equality of latent means. The equality of variances and covariances was not established ($\Delta\chi^2$ (28) = 570.948, p < .0001), which means the relationships of latent constructs between two groups are different (Table19). Thus, two separate SEM models were tested to evaluate the effects of age and gender on constructs in two groups. The structural model that includes both age and gender indicated good model fit (χ^2 (376) = 8691.464, p <.001, RMSEA = .061 $_{(.060 - .062)}$, CFI = .965, and TLI = .957).

As seen in Table 21, age significantly predicts all support needs measured by the SIS for Adults in both groups. Again, the construct that was most sensitive to age was Home Living Activities in both groups (γ = -.046, z = -7.367, p < .001 for the higher medical support-need group, γ = -.082, z = -12.506, p < .001 for the higher behavioral support-need group). Community Living Activities and Social Activities went after Home Living Activities in spite of

different orders in each group. As seen in Table 22, the results from nested chi-square tests by setting the structural model that keeps both age and gender variables as a baseline model indicated that the degrees to which age influences on each support need were the same with an exception of Home Living Activities (HLA: $\Delta \chi^2$ (1) = 16.09, $p < .0001$; CLA: $\Delta \chi^2$ (1) = 5.747, $p > .01$; LLA: $\Delta \chi^2$ (1) = 0.007, $p > .05$; EA: $\Delta \chi^2$ (1) = 0.258, $p > .05$; HSA: $\Delta \chi^2$ (1) = 2.914, $p > .05$; SA: $\Delta \chi^2$ (1) = 0.002, $p > .05$; and PAA: $\Delta \chi^2$ (1) = 0.013, $p > .05$). In terms of gender, as seen in Tables 23 and 24, males tend to have more support needs than females do in both higher and lower support-need groups in the area of Health and Safety Activities, yet no gender difference was found (HSA: $\Delta \chi^2$ (1) = 0.032, $p > .05$). Another latent mean parameter test, the equality of latent means, demonstrated the equivalent latent means across the two groups as seen in Table 19 ($\Delta \chi^2$ (7) = 7.104, $p > .05$).

Table 19

Fit Indices for the Nested Sequence in the Two-Group CFA (Higher Support-Need Groups)

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	RMSEA	RMSEA 90% CI	CFI	TLI	Constraint Tenable
Null Model	219309.433	372	.00	---	---	---	---	---	---	---	---
Configural Invariance[1]	8026.263	298	.00	---	---	---	0.066	.065-.067	.967	.958	---
Weak Invariance[1]	8148.046	311	.00	---	---	---	0.065	.064-.066	.967	.959	Yes
Strong Invariance[1]	8415.645	324	.00	---	---	---	0.065	.063-.066	.966	.960	Yes
With age and gender	8691.464	376	.00	---	---	---	0.061	.060-.062	.965	.957	Yes
With sig. paths	8746.031	388	.00	---	---	---	0.060	.059-.061	.965	.958	Yes
Homogeneity of Var/Cov[2]	8986.593	352	.00	570.948	28	<.0001	---	---	---	---	No
Latent Mean Invariance[2]	9409.556	331	.00	993.911	7	<.0001	---	---	---	---	No
With sig. paths	8753.135	395	.00	7.104	7	> .05	---	---	---	---	Yes

Note. Each nested model contains its constrains, plus the constraints of all previous, tenable models.
[1] Evaluated with RMSEA and CFI Model Test
[2] Evaluated with χ^2 Difference Test

Table 20

Loading and Intercept Values, Residuals, and R^2 Values for Each Parcel, and the Estimated Latent Variances

	Equated Estimates		Standardized		
Indicator	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Home Living Activities (MEDICAL): Estimated Latent Variance = 0.022					
Parcel 1	0.909 (0.004)	1.018 (0.001)	0.901	0.188	0.812
Parcel 2	1.009 (0.004)	0.995 (0.001)	0.912	0.169	0.831
Parcel 3	1.082 (0.004)	0.986 (0.002)	0.879	0.228	0.772
Home Living Activities (BEHAVIOR) : Estimated Latent Variance = 0.028					
Parcel 1	0.909 (0.004)	1.018 (0.001)	0.901	0.188	0.812
Parcel 2	1.009 (0.004)	0.995 (0.001)	0.919	0.156	0.844
Parcel 3	1.082 (0.004)	0.986 (0.002)	0.890	0.209	0.791
Community Living Activities (MEDICAL) : Estimated Latent Variance = 0.011					
Parcel 1	1.119 (0.005)	1.058 (0.002)	0.893	0.203	0.797
Parcel 2	0.849 (0.004)	0.989 (0.002)	0.854	0.270	0.730
Parcel 3	1.032 (0.005)	0.954 (0.002)	0.817	0.333	0.667
Community Living Activities (BEHAVIORAL) : Estimated Latent Variance = 0.014					
Parcel 1	1.119 (0.005)	1.058 (0.002)	0.909	0.174	0.826
Parcel 2	0.849 (0.004)	0.989 (0.002)	0.865	0.252	0.748
Parcel 3	1.032 (0.005)	0.954 (0.002)	0.833	0.307	0.693
Lifelong Learning Activities (MEDICAL) : Estimated Latent Variance = 0.017					
Parcel 1	1.002 (0.005)	0.974 (0.002)	0.855	0.269	0.731
Parcel 2	1.029 (0.004)	1.004 (0.001)	0.904	0.182	0.818
Parcel 3	0.969 (0.004)	1.022 (0.001)	0.899	0.192	0.808
Lifelong Learning Activities (BEHAVIORAL) : Estimated Latent Variance = 0.014					
Parcel 1	1.002 (0.005)	0.974 (0.002)	0.850	0.277	0.723
Parcel 2	1.029 (0.004)	1.004 (0.001)	0.881	0.224	0.776
Parcel 3	0.969 (0.004)	1.022 (0.001)	0.873	0.238	0.762
Employment Activities (MEDICAL): Estimated Latent Variance = 0.029					
Parcel 1	1.071 (0.004)	1.016 (0.001)	0.939	0.119	0.881
Parcel 2	0.910 (0.003)	0.933 (0.001)	0.943	0.111	0.889
Parcel 3	1.018 (0.004)	1.051 (0.001)	0.863	0.256	0.744

Indicator	Equated Estimates		Standardized		
	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Employment Activities (BEHAVIORAL) : Estimated Latent Variance = 0.025					
Parcel 1	1.071 (0.004)	1.016 (0.001)	0.936	0.124	0.876
Parcel 2	0.910 (0.003)	0.933 (0.001)	0.931	0.132	0.868
Parcel 3	1.018 (0.004)	1.051 (0.001)	0.848	0.280	0.720
Health and Safety Activities (MEDICAL) : Estimated Latent Variance = 0.016					
Parcel 1	1.058 (0.004)	0.978 (0.001)	0.893	0.203	0.797
Parcel 2	0.942 (0.004)	1.022 (0.001)	0.879	0.228	0.772
Health and Safety Activities (BEHAVIORAL) : Estimated Latent Variance = 0.016					
Parcel 1	1.058 (0.004)	0.978 (0.001)	0.886	0.216	0.784
Parcel 2	0.942 (0.004)	1.022 (0.001)	0.865	0.252	0.748
Social Activities (MEDICAL) : Estimated Latent Variance = 0.027					
Parcel 1	0.949 (0.005)	0.962 (0.002)	0.869	0.245	0.755
Parcel 2	0.930 (0.004)	0.978 (0.002)	0.879	0.227	0.773
Parcel 3	1.121 (0.005)	1.059 (0.002)	0.873	0.237	0.763
Social Activities (BEHAVIORAL) : Estimated Latent Variance = 0.021					
Parcel 1	0.949 (0.005)	0.962 (0.002)	0.855	0.269	0.731
Parcel 2	0.930 (0.004)	0.978 (0.002)	0.857	0.266	0.734
Parcel 3	1.121 (0.005)	1.059 (0.002)	0.852	0.274	0.726
Protection and Advocacy Activities (MEDICAL) : Estimated Latent Variance = 0.017					
Parcel 1	0.897 (0.004)	0.962 (0.002)	0.889	0.210	0.790
Parcel 2	0.860 (0.005)	0.899 (0.002)	0.861	0.258	0.742
Parcel 3	1.244 (0.006)	1.139 (0.002)	0.844	0.287	0.713
Protection and Advocacy Activities (BEHAVIORAL) : Estimated Latent Variance = 0.014					
Parcel 1	0.897 (0.004)	0.962 (0.002)	0.874	0.237	0.763
Parcel 2	0.860 (0.005)	0.899 (0.002)	0.844	0.287	0.713
Parcel 3	1.244 (0.006)	1.139 (0.002)	0.817	0.332	0.668

Table 21

Gamma Weights Indicating the Impact of Age on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Higher Medical Support-Need Group				
HLA	-0.046 (0.006)	-7.367	0.000	-0.103
CLA	-0.041 (0.006)	-6.392	0.000	-0.091
LLA	-0.046 (0.008)	-5.883	0.000	-0.083
EA	-0.035 (0.008)	-4.708	0.000	-0.065
HSA	-0.031 (0.007)	-4.274	0.000	-0.062
SA	-0.056 (0.008)	-7.039	0.000	-0.100
PAA	-0.032 (0.008)	-4.165	0.000	-0.059
Higher Behavioral Support-Need Group				
HLA	-0.082 (0.007)	-12.506	0.000	-0.160
CLA	-0.063 (0.007)	-9.401	0.000	-0.122
LLA	-0.046 (0.007)	-6.955	0.000	-0.091
EA	-0.040 (0.007)	-6.202	0.000	-0.079
HSA	-0.048 (0.007)	-7.051	0.000	-0.093
SA	-0.056 (0.007)	-8.320	0.000	-0.109
PAA	-0.031 (0.007)	-4.641	0.000	-0.061

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 22

Tests of Gamma Weights Indicating the Impact of Age across the Two Groups

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Structural model[1]	8691.464	376	0.00	---	---	---	---
HLA	8707.554	377	0.00	1	16.09	<.0001	No
CLA	8697.211	377	0.00	1	5.747	>.01	Yes
LLA	8691.471	377	0.00	1	0.007	>.05	Yes
EA	8691.722	377	0.00	1	0.258	>.05	Yes
HSA	8694.378	377	0.00	1	2.914	>.05	Yes
SA	8691.466	377	0.00	1	0.002	>.05	Yes
PAA	8691.477	377	0.00	1	0.013	>.05	Yes

Note. [1] Structural model with age and gender variables (baseline model); HLA= home living activities; CLA= community living activities; LLA= lifelong learning activities; EA= employment activities; HSA= health and safety activities; SA= social activities; and PAA= protection and advocacy activities.

Table 23

Gamma Weights Indicating the Impact of Gender (0=Female 1=Male) on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Higher Medical Support-Need Group				
HLA	-0.059 (0.026)	-2.292	0.022	-0.032
CLA	-0.027 (0.026)	-1.038	0.299	-0.015
LLA	0.055 (0.032)	1.745	0.081	0.025
EA	0.045 (0.031)	1.473	0.141	0.020
HSA	-0.097 (0.030)	-3.252	0.001	-0.047
SA	0.058 (0.033)	1.787	0.074	0.025
PAA	0.008 (0.032)	0.236	0.813	0.003
Higher Behavioral Support-Need Group				
HLA	-0.042 (0.027)	-1.555	0.120	-0.020
CLA	0.007 (0.027)	0.250	0.803	0.003
LLA	0.046 (0.028)	1.656	0.098	0.021
EA	0.043 (0.027)	1.602	0.109	0.020
HSA	-0.089 (0.028)	-3.186	0.001	-0.042
SA	0.044 (0.028)	1.586	0.113	0.021
PAA	0.009 (0.028)	0.314	0.753	0.004

Note. HLA = home living activities; CLA = community living activities; LLA = lifelong learning activities; EA = employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

Table 24

Tests of Gamma Weights Indicating the Impact of Gender across the Two Groups

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Structural model[1]	8691.464	376	0.00	---	---	---	---
HSA	8691.496	377	0.00	1	0.032	>.05	Yes

Note. [1] Structural model with age and gender variables (baseline model); HSA= health and safety activities.

Main Research Question Five

Measurement model for each group. The CFA model for each group demonstrated good fit, χ^2 (149) = 5215.299, CFI = .974, TLI = .967, RMSEA = .063 $_{(.062\text{-}.065)}$, and SRMR=.022 for the lower medical support-need group and χ^2 (149) = 5273.148, CFI = .972, TLI = .965, RMSEA = .068 $_{(.066\text{-}.070)}$, and SRMR=.023 for the lower behavioral support-need group, respectively.

Testing measurement parameters. The procedures to evaluate measurement parameters were performed in the same manner described in the preceding section. The configural invariance model demonstrated good model fit indices: χ^2 (298) = 10488.446, CFI = .973, TLI = .966, and RMSEA = .065 $_{(.064 - .067)}$, indicating that people in both higher and lower behavioral support-need groups have the same pattern of fixed and freed parameters for each support-need construct. In addition, both weak and strong invariance models were established based on the CFI criterion (i.e., ΔCFI < .01), suggesting that corresponding factor loadings and intercepts are equivalent across the two groups. Table 25 provides fit indices for the nested sequences to determine measurement invariances. The loading and intercept values, residuals, R^2 values for each parcel, as well as the estimated latent variances from the strong invariance model are presented in Table 26.

Testing latent parameters. Given the support from the established measurement invariance models, the equality of factor variance/covariances and the equality of latent means were tested. As displayed in Table 25, the equality of variances and covariances between the two groups was not established (χ^2 (28) = 519.324, p < .0001), informing us to run two different SEM models for each group to evaluate impacts of age and gender. The structural model that

includes both age and gender variables demonstrated good model fit (χ^2 (376) = 11223.018, p <.001, CFI = .972, TLI = .965, and RMSEA = .060 $_{(.059 - .061)}$).

Age significantly predicts all support needs in both lower medical and behavioral support-need groups, presenting that participants tend to have fewer support needs as they get older (Table 27). Specifically, the construct that was most sensitive to age was Home Living Activities in both groups (γ = -.092, z = -17.380, p < .001 for the lower medical support-need group, γ = -.108, z = -17.141, p < .001 for the lower behavioral support-need group). Social Activities and Community Living Activities were the second and third constructs that were most influenced by age in the lower support-need medical group, whereas Social Activities and Health and Safety Activities were the second and third constructs in the lower behavioral support-need group. As seen in Table 28, the impacts of age on each counterpart support need are identical between two groups (HLA: $\Delta\chi^2$ (1) = 3.889, p > .01; CLA: $\Delta\chi^2$ (1) = 0.636, p > .05; LLA: $\Delta\chi^2$ (1) = 0.382, p > .05; EA: $\Delta\chi^2$ (1) = 0.150, p > .05; HSA: $\Delta\chi^2$ (1) = 4.446, p > .01; SA: $\Delta\chi^2$ (1) = 0.103, p > .05; and PAA: $\Delta\chi^2$ (1) = 0.159, p > .05). With respect to the gender influence, only lower medical support-need group had the gender difference with the exception of Health and Safety Activities, representing that males tend to have more support needs that females do (Table 29).

In addition, the equality of latent means was tested by setting the significant age and gender influences as covariates to control for their impacts on the latent constructs. As seen in Table 25, the average mean of seven latent constructs was not the same between the two groups ($\Delta\chi^2$ (7) = 27.903, p < .0001). Thus, individual mean comparisons were conducted to find which latent mean was making the difference. However, as seen in Table 30, none of the individual tests had a mean difference. When the latent means of Home Living Activities and

Health and Safety Activities, which were close to the border line of the 0.001 criterion, were freely estimated at the same time, these two constructs as a set appear to have different mean levels ($\Delta \chi^2$ (2) = 25.312, $p < .0001$). Participants with lower behavior support needs tend to have intense support needs in both Home Living Activities and Health and Safety Activities than participants with higher medical support needs (Table 31).

Table 25

Fit Indices for the Nested Sequence in the Two-Group CFA (Lower Support-Need Groups)

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	RMSEA	RMSEA 90% CI	CFI	TLI	Constraint Tenable
Null Model	351142.606	372	.00	---	---	---	---	---	---	---	---
Configural Invariance[1]	10488.446	298	.00	---	---	---	0.065	.064 - .067	0.973	0.966	---
Weak Invariance[1]	10658.909	311	.00	---	---	---	0.065	.064 - .066	0.973	0.967	Yes
Strong Invariance[1]	10886.306	324	.00	---	---	---	0.064	.063 - .065	0.972	0.968	Yes
With age and gender	11223.018	376	.00	---	---	---	0.060	.059 - .061	0.972	0.965	Yes
With sig. paths	11306.709	384	.00	---	---	---	0.060	.059 - .061	0.971	0.966	Yes
Homogeneity of Var/Cov[2]	11405.630	352	.00	519.324	28	<.0001	---	---	---	---	No
Latent Mean Invariance[2]	11406.730	331	.00	520.424	7	<.0001	---	---	---	---	No
With sig. paths[2]	11334.612	391	.00	27.903	7	<.001	---	---	---	---	No

Note. Each nested model contains its constrains, plus the constraints of all previous, tenable models.
[1] Evaluated with RMSEA and CFI Model Test
[2] Evaluated with χ^2 Difference Test

Table 26

Loading and Intercept Values, Residuals, and R^2 Values for Each Parcel, and the Estimated Latent Variances

	Equated Estimates		Standardized		
Indicator	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Home Living Activities (MEDICAL): Estimated Latent Variance = 0.038					
Parcel 1	1.012 (0.003)	1.063 (0.002)	0.917	0.159	0.841
Parcel 2	0.974 (0.003)	0.984 (0.002)	0.911	0.170	0.830
Parcel 3	1.014 (0.003)	0.953 (0.002)	0.890	0.208	0.792
Home Living Activities (BEHAVIOR) : Estimated Latent Variance = 0.049					
Parcel 1	1.012 (0.003)	1.063 (0.002)	0.936	0.124	0.876
Parcel 2	0.974 (0.003)	0.984 (0.002)	0.933	0.130	0.870
Parcel 3	1.014 (0.003)	0.953 (0.002)	0.915	0.163	0.837
Community Living Activities (MEDICAL) : Estimated Latent Variance = 0.026					
Parcel 1	1.122 (0.003)	1.064 (0.002)	0.926	0.143	0.857
Parcel 2	0.920 (0.003)	1.022 (0.002)	0.903	0.185	0.815
Parcel 3	0.957 (0.004)	0.914 (0.002)	0.861	0.258	0.742
Community Living Activities (BEHAVIORAL) : Estimated Latent Variance = 0.028					
Parcel 1	1.122 (0.003)	1.064 (0.002)	0.930	0.134	0.866
Parcel 2	0.920 (0.003)	1.022 (0.002)	0.911	0.169	0.831
Parcel 3	0.957 (0.004)	0.914 (0.002)	0.874	0.237	0.763
Lifelong Learning Activities (MEDICAL) : Estimated Latent Variance = 0.023					
Parcel 1	1.057 (0.004)	0.983 (0.002)	0.869	0.245	0.755
Parcel 2	0.977 (0.003)	0.993 (0.001)	0.885	0.217	0.783
Parcel 3	0.966 (0.003)	1.024 (0.001)	0.888	0.212	0.788
Lifelong Learning Activities (BEHAVIORAL) : Estimated Latent Variance = 0.026					
Parcel 1	1.057 (0.004)	0.983 (0.002)	0.872	0.239	0.761
Parcel 2	0.977 (0.003)	0.993 (0.001)	0.899	0.191	0.809
Parcel 3	0.966 (0.003)	1.024 (0.001)	0.900	0.190	0.810
Employment Activities (MEDICAL): Estimated Latent Variance = 0.035					
Parcel 1	1.101 (0.003)	1.019 (0.001)	0.933	0.130	0.870
Parcel 2	0.845 (0.003)	0.912 (0.001)	0.927	0.140	0.860
Parcel 3	1.054 (0.004)	1.069 (0.002)	0.835	0.302	0.698

	Equated Estimates		Standardized		
Indicator	Loading (*SE*)	Intercept (*SE*)	Loading	Theta	R^2
Employment Activities (BEHAVIORAL) : Estimated Latent Variance = 0.040					
Parcel 1	1.101 (0.003)	1.019 (0.001)	0.935	0.125	0.875
Parcel 2	0.845 (0.003)	0.912 (0.001)	0.932	0.131	0.869
Parcel 3	1.054 (0.004)	1.069 (0.002)	0.842	0.291	0.709
Health and Safety Activities (MEDICAL) : Estimated Latent Variance = 0.025					
Parcel 1	0.984 (0.003)	0.944 (0.001)	0.907	0.178	0.822
Parcel 2	1.016 (0.003)	1.056 (0.001)	0.896	0.198	0.802
Health and Safety Activities (BEHAVIORAL) : Estimated Latent Variance = 0.032					
Parcel 1	0.984 (0.003)	0.944 (0.001)	0.922	0.151	0.849
Parcel 2	1.016 (0.003)	1.056 (0.001)	0.918	0.157	0.843
Social Activities (MEDICAL) : Estimated Latent Variance = 0.040					
Parcel 1	0.981 (0.003)	0.974 (0.002)	0.913	0.166	0.834
Parcel 2	0.946 (0.003)	0.998 (0.002)	0.908	0.176	0.824
Parcel 3	1.073 (0.003)	1.027 (0.002)	0.894	0.201	0.799
Social Activities (BEHAVIORAL) : Estimated Latent Variance = 0.044					
Parcel 1	0.981 (0.003)	0.974 (0.002)	0.916	0.161	0.839
Parcel 2	0.946 (0.003)	0.998 (0.002)	0.912	0.168	0.832
Parcel 3	1.073 (0.003)	1.027 (0.002)	0.902	0.186	0.814
Protection and Advocacy Activities (MEDICAL) : Estimated Latent Variance = 0.023					
Parcel 1	0.886 (0.003)	0.962 (0.002)	0.903	0.184	0.816
Parcel 2	0.840 (0.003)	0.889 (0.002)	0.885	0.217	0.783
Parcel 3	1.274 (0.004)	1.149 (0.002)	0.871	0.241	0.759
Protection and Advocacy Activities (BEHAVIORAL) : Estimated Latent Variance = 0.025					
Parcel 1	0.886 (0.003)	0.962 (0.002)	0.911	0.170	0.830
Parcel 2	0.840 (0.003)	0.889 (0.002)	0.893	0.202	0.798
Parcel 3	1.274 (0.004)	1.149 (0.002)	0.883	0.220	0.780

Table 27

Gamma Weights Indicating the Impact of Age on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Lower Medical Support-Need Group				
HLA	-0.092 (0.005)	-17.380	0.000	-0.194
CLA	-0.085 (0.006)	-14.932	0.000	-0.167
LLA	-0.060 (0.006)	-10.680	0.000	-0.121
EA	-0.078 (0.006)	-13.932	0.000	-0.155
HSA	-0.076 (0.005)	-14.178	0.000	-0.162
SA	-0.094 (0.006)	-16.659	0.000	-0.186
PAA	-0.068 (0.006)	-11.940	0.000	-0.135
Lower Behavioral Support-Need Group				
HLA	-0.108 (0.006)	-17.141	0.000	-0.202
CLA	-0.092 (0.006)	-14.612	0.000	-0.174
LLA	-0.065 (0.006)	-10.266	0.000	-0.124
EA	-0.081 (0.006)	-12.932	0.000	-0.154
HSA	-0.093 (0.006)	-14.635	0.000	-0.176
SA	-0.097 (0.006)	-15.345	0.000	-0.183
PAA	-0.071 (0.006)	-11.283	0.000	-0.136

Note. HLA= home living activities; CLA= community living activities; LLA= lifelong learning activities; EA= employment activities; HSA= health and safety activities; SA= social activities; and PAA= protection and advocacy activities.

Table 28

Tests of Gamma Weights Indicating the Impact of Age across the Two Groups

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Structural model[1]	11223.018	376	0.00	---	---	---	---
HLA	11226.907	377	0.00	1	3.889	>.01	Yes
CLA	11223.654	377	0.00	1	0.636	>.05	Yes
LLA	11223.400	377	0.00	1	0.382	>.05	Yes
EA	11223.168	377	0.00	1	0.150	>.05	Yes
HSA	11227.464	377	0.00	1	4.446	>.01	Yes
SA	11223.121	377	0.00	1	0.103	>.05	Yes
PAA	11223.177	377	0.00	1	0.159	>.05	Yes

Note. [1] Structural model with age and gender variables (baseline model); HLA= home living activities; CLA= community living activities; LLA= lifelong learning activities; EA= employment activities; HSA= health and safety activities; SA= social activities; and PAA= protection and advocacy activities.

Table 29

Gamma Weights Indicating the Impact of Gender (0=Female 1=Male) on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
Lower Medical Support-Need Group				
HLA	0.088 (0.020)	4.286	0.000	0.047
CLA	0.074 (0.022)	3.329	0.001	0.037
LLA	0.114 (0.022)	5.211	0.000	0.059
EA	0.125 (0.022)	5.744	0.000	0.064
HSA	0.054 (0.021)	2.580	0.010	0.029
SA	0.141 (0.022)	6.448	0.000	0.071
PAA	0.109 (0.022)	4.923	0.000	0.055
Lower Behavioral Support-Need Group				
HLA	-0.003 (0.024)	-0.122	0.903	-0.001
CLA	-0.032 (0.024)	-1.335	0.182	-0.016
LLA	0.035 (0.025)	1.434	0.152	0.017
EA	0.049 (0.024)	2.026	0.043	0.024
HSA	-0.049 (0.025)	-2.005	0.045	-0.024
SA	0.039 (0.024)	1.622	0.105	0.019
PAA	0.025 (0.024)	1.002	0.316	0.012

Note. HLA= home living activities; CLA= community living activities; LLA= lifelong learning activities; EA= employment activities; HSA= health and safety activities; SA= social activities; and PAA= protection and advocacy activities.

Table 30

Tests of the Latent Means (Lower Support-Need Groups)

Model	χ^2	*df*	*P*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable	Effect Size[1]
Strong Invariance with significant paths (Baseline Model)	11306.709	384	.00	---	---	---	---	---
Latent Mean Invariance with sig. paths	11334.612	391	.00	27.903	7	0.0002	No	---
Home Living Activities (HLA)	11328.786	390	.00	5.826	1	0.009	Yes	---
Community Living Activities (CLA)	11333.686	390	.00	0.926	1	0.261	Yes	---
Lifelong Learning Activities (LLA)	11334.189	390	.00	0.423	1	0.496	Yes	---
Employment Activities (EA)	11334.491	390	.00	0.121	1	1.080	Yes	---
Health and Safety Activities (HSA)	11326.781	390	.00	7.831	1	0.003	Yes	---
Social Activities (SA)	11329.048	390	.00	5.564	1	0.010	Yes	---
Protection and Advocacy Activities (PAA)	11334.116	390	.00	0.496	1	0.442	Yes	---
HLA & HSA	11309.300	389	.00	25.312	2	0.000	No	---

Note. [1] Effect size is latent *d*, where $d = (\alpha_2-\alpha_1)/\sqrt{\frac{(n_1 * \psi_1 + n_2 * \psi_2)}{n_1 + n_2}}$; α_2 and α_1 are the estimated means in latent variable metric; n_2 and n_1 are the sample size for each group; ψ_2 and ψ_1 are the estimated latent variances of the distributions around the latent means of α_2 and α_1, respectively. χ^2 = chi-square value; *df* = degrees of freedom; *p* = *p* value; $\Delta\chi^2$ = changes in chi-square values.

Table 31

Estimated Latent Means (Lower Support-Need Groups)

	Medical Support-Need Group		Behavioral Support-Need Group	
Constructs	*M*	*SE*	*M*	*SE*
Home Living Activities	2.056	0.020	2.211	0.021
Health and Safety Activities	2.753	0.026	2.861	0.027

Note. Unstandardized values are presented.

Main Research Question Six

The correlations among seven latent constructs are presented in Table 32. The Pearson correlation coefficients ranged from 0.667 to 0.905 and every coefficient turned out to be significant at the level of .001. In particular, correlations suggest strong relationships between constructs measured by the *Support Needs Index Scale* (i.e., constructs of HLA, CLA, LLA, EA, HSA, and SA) and a construct measured by the *Supplemental Protection and Advocacy Scale* (i.e., PAA). The correlations between constructs in the *Support Needs Index Scale* (i.e., HLA, CLA, LLA, EA, HSA, and SA) and PAA were 0.667, 0.790, 0.881, 0.793, 0.868, and 0.873, respectively. The highest correlation was between Lifelong Learning Activities and Protection and Advocacy Activities (r = .881), accounting for about 78% of the shared variance between these two constructs. On the other hand, the lowest correlation was found between Home Living Activities and Protection and Advocacy activities (r = .667), explaining about 44% of shared variance between these two constructs. The next step was to examine the creation of a higher-order construct from seven lower-order support-need constructs that form the SIS for Adults (see Figure 5). The structural model with this second-order construct demonstrated good model fit indices (χ^2 (163) = 14962.246, p < .001, CFI = 0.956, TLI = 0.948, SRMR = 0.037, and RMSEA = .081 $_{(0.080\text{-}0.082)}$). As seen in Table 33, the SIS for Adults had significant and relatively equal

standardized beta values on a higher-order support needs, suggesting that seven lower-order constructs measure a single underlying support needs.

Table 32

Correlations between Constructs Measured by the SIS for Adults

	HLA	CLA	LLA	EA	HSA	SA	PAA
HLA	1						
CLA	0.850***	1					
LLA	0.729***	0.829***	1				
EA	0.675***	0.747***	0.805***	1			
HSA	0.897***	0.886***	0.889***	0.785***	1		
SA	0.784***	0.850***	0.848***	0.807***	0.905***	1	
PAA	0.667***	0.790***	0.881***	0.793***	0.868***	0.873***	1

Note. HLA= home living activities; CLA=community living activities; LLA= lifelong learning activities; EA= employment activities; HSA= health and safety activities; SA= social activities; and PAA= protection and advocacy activities.

*** $p < .001$.

Table 33

Loadings of the Lower-Order Constructs on a Higher-Order Support Needs

Lower-Order Construct	*Standardized Beta (SE)*	*z-score*	*p*-value
Home living activities	0.853 (0.003)	301.618	0.000
Community living activities	0.911 (0.002)	441.368	0.000
Lifelong learning activities	0.920 (0.002)	449.481	0.000
Employment activities	0.839 (0.003)	280.006	0.000
Health and safety activities	0.974 (0.001)	695.519	0.000
Social activities	0.937 (0.002)	557.497	0.000
Protection and advocacy activities	0.900 (0.002)	389.494	0.000

Discussion

The Supports Intensity Scale for Adults is the only normed-referenced assessment that measures the support needs of people with intellectual and developmental disabilities. Given the growing emphasis on new understandings of disability and the increased attention to support needs in the field of intellectual disability, investigating relationships between and among individual factors and support needs is important to better understand the process of measuring support needs and planning supports. In addition, studies that examine the validity of the SIS for Adults should be continuously conducted to expand its usage. In this regard, this study explored the relationships between individual variables and support needs, both with and without considering exceptional support needs, and investigated the underlying relationships among support needs that form the structure of the SIS for Adults. The results of this study provide implications in evaluating and reducing individuals' support needs and ensure the further validity of the SIS-A. The discussion section includes three sections: limitations of the study, the summary of the findings, and implications for practice and future research.

Limitations of the Study

In interpreting the findings of this study, several limitations should be considered. It was not possible to present the overall demographic information of participants, including ethnicities, socio-cultural backgrounds, the possible presence of dual disabilities, and estimated intelligence and adaptive behavior skills, since the data was collected based on indicators listed in the initial generation of the SIS using AAIDD's SISOnline software system. Given the importance of context in understanding intellectual disability, other ecological factors (e.g., residence style and educational setting) would also contribute to an individual's frequency, duration, and type of supports. Future studies will be needed to explore more personal or environmental factors that

influence support needs. In addition, the study would have been stronger if students' exceptional needs were measured by statistically reliable and valid instruments to provide more meaningful interpretations. However, the criterion and items used in this study to categorize higher or lower exceptional-need groups were derived from the *Users' Manual* (Thompson et al., 2004b) and they were justified based on the SIS committee members' accumulated experiences and expertise. Lastly, the SIS-A is designed to measure support needs of individuals with intellectual disability over a wide age-spectrum from 16 to 64. In addition to information about adolescents and young adults, as provided in this study, future research needs to include people across the life span to provide more generalized findings pertaining to support needs across the lifespan.

Summary of the Findings

Age and gender effect. This study offers evidence that age significantly predicts every support need measured by the SIS-A. Overall, as young people in this study aged, they tended to have lower levels of support needs. Specifically, support need for Home Living Activities was the construct that was most highly influenced by age. The next constructs, in order of the degree to which they were influenced by age, were Social Activities, Community Living Activities, Health and Safety Activities, Employment Activities, Lifelong Learning Activities, and Protection and Advocacy Activities. A similar order was replicated when examining the impact of age in persons grouped by their levels or types of exceptional support needs; Home Living Activities, Social Activities, and Community Living Activities are the domains that are consistently on the top of the lists.

As individuals age, they have fewer support needs in areas where learning functional skills and opportunities to practice those skills occur. Although different constructs were measured and the study focused on individuals' mastery of skills, it is worth noting findings from

Bailey, Raspa, Holiday, Bishop, and Olmsted (2009) to make this point. In investigating the functional skill attainment of individuals with Fragile X syndrome using a cross-sectional approach, Bailey et al. (2009) found that the majority of study participants who are 20 years old or older demonstrated mastery levels of daily living skills, including eating, dressing, bathing, and toileting, which are consistent with support-need indicators for Home Living Activities in the SIS-A.

On the other hand, study participants are more likely to have increased levels of support needs in areas of Employment Activities, Lifelong Learning Activities, and Protection and Advocacy Activities as they got older. This is logical in the context of youth and young adults, as it would be developmentally typical to assume such roles as one exits high school and enters college or the work force, and provides additional information to confirm the validity of the SIS-A. To a certain degree, this finding supports comments made by Shogren and Plotner (2012), who analyzed the transition planning of young people with intellectual disability, autism, and other disabilities using the National Longitudinal Transition Study-2 dataset. Shogren and Plotner (2012) documented that students with intellectual disability are more likely to have transition goals that aim to build functional independence and social relationships, whereas goals related to employment are not frequently addressed in their transition planning. Their findings bring attention to the fact that adolescents or young adults with intellectual disability have relatively limited experiences or learning opportunities to successfully function in employment. The areas of employment, lifelong learning, and protection and advocacy activities require more complex and comprehensive skills that cannot be gradually acquired as children develop, and, predictably, intense supports should be provided. In the future, it would be helpful to conduct

longitudinal studies that explore how support needs may change across the life-span and which personal or contextual variables would lead to those changes.

In terms of gender impact on support needs of young adults with intellectual disability, males tend to have more support needs than did females in areas of Lifelong Learning Activities, Employment Activities, Social Activities, and Protection and Advocacy Activities. Unlike gender-based differences in autism spectrum disorders that have been continuously investigated (e.g., Attwood, 2007; Gillberg, 2005; Manwaring, 2008), gender differences in intellectual disability have been largely unexplored with the exception of the psychopathology area (Lunsky, 2003; Lunsky & Canrinus, 2005; Warren et al., 2005). This would be, in part, because of the similarly reported gender prevalence rates of intellectual disability (Oswald, Best, Coutinho, & Nagle, 2003) and the assumption that gender difference is not an important feature of intellectual disability as it is in other types of disability. Perhaps more intense levels of support needs indicated by males is due to the relatively higher rates of diagnosis for men in externalizing behavior disorder, attention deficit hyperactivity disorder, psychiatric disorder, and personality disorder (American Psychiatric Association, 2013; Tassé & Wehmeyer, 2010; Tsakanikos, Bouras, Sturmey, & Holt, 2006). Future studies need to include more systematic investigations on how individual's psychiatric co-morbidity and support needs interplay and how gender uniquely functions in these associations.

Measurement and structural models. The measurement invariance evaluation has a significant importance in developing an instrument's psychometric properties (Brown, 2006; Little, 2013). In this study, four measurement invariance tests were established based on each main research question, providing additional evidence of *validity assurances* and potential utility of the SIS-A to measure support needs in different groups of individuals with intellectual

disability (Little, 2013). Furthermore, the homogeneity of variances and covariances was not established, indicating that the two groups described within each research question had the different amount of variability (i.e., dispersion) within each pair of counterpart constructs and different patterns of interrelationships across the constructs. In other words, the characteristics of participants in groups have moderating influences on the relationships among support-need constructs, either within each group or between groups (Little, 2013). Perhaps study results that indicate the heterogeneity of variances and covariances in each research question stem from the heterogeneous samples collected from different contexts, including a large number of states, school districts, and organizations.

The latent mean differences emerged when we included significant age or gender paths as covariates. The most distinct differences were found across groups of higher and lower behavioral support needs; Lifelong Learning Activities and Health and Safety Activities revealed mean differences across the two groups. Studies have documented the relationships between challenging behaviors and less desirable learning-related performances across diverse groups of individuals, including students without special needs (Hinshaw, 1992; McIntosh, Flannery, Sugai, Braun, & Cochrane, 2008), students with attention deficit hyperactivity disorder (Ek, Westerlund, Holmberg, & Fernell, 2011; Daley & Birchwood, 2010), students with emotional and behavioral disorders (Barriga et al., 2002; Nelson, Benner, Lane, & Smith, 2004), and students with autism spectrum disorders (Ashburner, Ziviani, & Rodger, 2010). These studies indicated that individuals' problem behaviors interfere with academic learning activities and/or lead to lower academic achievements in core curriculum subjects.

The present study, however, indicated an interesting result. As seen in Table 18, participants with higher behavioral support needs tend to have fewer support needs in Lifelong

Learning Activities than participants with lower behavioral support needs. Perhaps the research design used in this study would explain this finding to a certain degree. The protocols of exceptional behavioral support needs include four categories: externally-directed destructiveness, self-directed destructiveness, sexual, and other. The total of 13 protocols mainly addresses the support needs for individuals' externalized challenging behaviors. Individuals who do not show aggressive behaviors, but possibly have internalized problem behaviors, form the lower behavioral support-need group in this study. It is possible that populations who are withdrawn or depressed would have more intense support needs or would appear to need more supports in daily activities when they feel less motivated to function or they can easily obtain supports from others. However, we do not know how many individuals with internalized behavioral problems form the lower behavioral support-need group using this data; therefore, this explanation should be understood with this caveat. Given the limited amount of studies that explored internalized problem behaviors of people with intellectual disability due to their lack of vocabularies or abstract thinking, future studies will need to empirically examine the relationships between the support needs and the broad spectrum of problem behaviors of people with intellectual disability, including both external and internal problem behaviors.

On the other hand, participants with higher behavioral support needs tend to have more intense support needs in Health and Safety Activities than those who have lower needs. Although the percentage of challenging behaviors exhibited by participants with intellectual disability varies depending on the sampling method, the criteria used to define challenging behaviors, and countries where the data collection occurred, studies have consistently addressed that overt challenging behaviors are prevalent among people with intellectual disability (Cooper et al., 2009; Crocker et al., 2006; Borthwick-Duffy, 1994; Lowe et al., 2007). The common

forms of challenging behaviors include aggression, self-injury, and property destruction. For example, in a large US study, Borthwick-Duffy (1994) reported that 2.1% of people in their sample with developmental disabilities showed aggression, 2.2% displayed self-injury, and 7.1% exhibited serious property destruction. Likewise, in a large study in England, Emerson et al. (2001) reported that 7% of the people in their sample were aggressive, 4%-5% showed destructive behavior, and 4% were self-injurious. Accordingly, people with higher behavioral support needs are more likely to get involved in risk situations and have intense support needs in the area of Health and Safety Activities than those with lower support needs. In addition, multiple studies have documented that many people with intellectual disability have used medication for purposes of behavioral restraint, which also leads to higher levels of support need in the area of Health and Safety Activities (Fleming, Caine, Ahmed, & Smith, 1996; Kiernan, Reeves, & Alborz, 1995; Matson & Neal, 2009; McGillivray & McCabe, 2004).

People with intellectual disability experience health inequalities that include a shorter life expectancy and a higher proportion of secondary health conditions than their peers without disabilities. Many studies detail efforts to promote positive health outcomes in people with intellectual disability (Cooper, Smiley, Morrison, Williamson, & Allan, 2007; Scheepers et al., 2005; Shogren, Wehmeyer, Reese, & O'hara, 2006). For example, Shogren et al. (2006) emphasized issues involved in consumer control and self-determination to address health disparities of people with intellectual disability and to enhance their health and medical care. Focusing on a different angle, the present study provides an initial picture of how the medical support needs of adolescents and young adults with intellectual disability may influence their other support needs, particularly targeting the mean-level differences that exclude measurement errors within the SEM framework.

The Lifelong Learning Activities domain was the only domain that showed a different mean level depending on levels of medical support needs. Interestingly, the Health and Safety Activities domain scores tend to have the same mean level across the two groups. A possible explanation of this result is related to the nature and scope of protocols in the Exceptional Medical Support Needs and Health and Safety Activities. The items of the medical support needs cover specific exceptional medical care, such as tube feeding or seizure management, whereas items of the Health and Safety Activities are more multifaceted in addressing individuals' physical, mental, and emotional well-being, safety issues, and emergency practices. Thus, the data seems to suggest that having more medical support needs does not necessarily lead to higher intensities of support needs in the area of Health and Safety Activities.

Other interesting results were found in research questions four and five. Participants with higher medical support needs and higher behavioral support needs, who would demonstrate relatively lower human functioning, did not have mean differences in support needs. However, participants with lower medical support needs and lower behavioral support needs did have different levels of support needs. Although none of the individual constructs turned out to be different across the two groups of higher medical and behavioral support needs, Home Living Activities and Health and Safety Activities as a set appeared to have unequal mean levels between these two groups. Specifically, participants with lower behavioral support needs tend to have more intense support needs in both Home Living Activities and Health and Safety Activities than participants with lower medical support needs.

It is worth combining this result with the previously documented result to identify the function of a person's challenging behaviors on support needs. In addressing the third research finding, participants with lower behavior support needs appeared to have less intense support

needs in Health and Safety Activities than participants with higher behavior support needs. Combined together, participants with higher behavioral support needs had the most intense support needs in the area of Health and Safety Activities among participants with lower behavioral, higher medical, and lower medical support needs. This result goes back to the explanation of the nature and scope of protocols in Health and Safety Activities, providing further evidence that the presence of challenging behaviors was strongly associated with the increased support needs in the specific area of Health and Safety Activities.

Underlying correlations. Moderate to strong correlations were found among seven support needs domains (i.e., Home Living Activities, Community Living Activities, Lifelong Learning Activities, Employment Activities, Health and Safety Activities, Social Activities, and Protection and Advocacy activities). Among those correlations, in particular, the aforementioned six activities that form the *Support Needs Index Scale* and the final *Supplemental Protection and Advocacy Scale* had moderate to strong correlations. This result supports an underlying assumption that indicates "SIS subscales measure various aspects of support provision, they should correlate significantly with each other" (Thompon et al., 2004b, p. 109). Consequently, the data supported the creation of a higher-order support-need construct derived from all seven support needs, including ones from *Support Needs Index Scale* and the one from *Supplemental Protection and Advocacy Scale*.

This result has a significant implication for the field. As discussed in the Introduction section, there have been ongoing efforts to refine the *Support Needs Index Scale* and the *Supplemental Protection and Advocacy Scale*. Based on interrater reliability results from the standardization data collection, the *Protection and Advocacy* subscale was excluded when determining the total Support Needs Intensity Score and this scale serves as a supplementary

subscale that promotes the educational problem-solving process. There is, however, a caveat that must be addressed. Although the *Protection and Advocacy subscale* is one of the constructs that demonstrates an individual's support needs as shown in the current study, it is possible for people to consider this subscale as a separate subscale. The review written in the Buros Mental Measurements Yearbook (Spies & Plake, 2005), one of the most widely used reference series in psychology and education, pointed to this aspect and indicated the possibility that the SIS is misunderstood or is not appropriately used:

> The first section that deals with supports needed and the intensity of those supports seems to provide the most useful information. […] The second section explores Protection and Advocacy areas but it is unclear how this information is to be used. This might be useful information but an overworked case manager may not see the point of asking for it if there is no apparent relevance to it. (p. 238)

As such, more attention should be focused on clarifying and disseminating the intent or usage of the *Protection and Advocacy* subscale and its inter-relationships with other constructs in the *Support Needs Index Scale*.

As supported in our data, people need to understand that the Protection and Advocacy is one of the main constructs that makes up the latent higher-order support needs construct and it should not be regarded as an independent subscale. Given the fact that "support needs will vary along a continuum; that is, there are in actuality fine gradations in the intensities of needs for different individuals" (Thompson et al., 2004b, p.35), one should consider the overall Support Needs Profile that includes the composite support need standard score, each score from the Support Needs Scale, Protection and Advocacy subscale, and Exceptional Medical and Behavioral support needs when creating an individualized support plan. By doing so,

practitioners, people with disabilities, and their families would be able to maximize their benefits out of the SIS and improve human functioning to the highest degree possible.

Implications for Practice and Future Research

The results from this study provided implications to the service-delivery for people with intellectual disability. The study results established additional validity of the SIS-A and confirmed its potential utility to evaluate support needs in different sub-groups of individuals with intellectual disability, particularly in this case, adolescents and young adults. Such psychometric-related findings are important to inform future efforts to develop, validate, implement, and evaluate interventions to improve the fit between personal capacities and environmental requirements.

This study shows that a person's intensity of support needs tends to be influenced by various individual factors, including age, gender, challenging behaviors, and health problems. The majority of findings originated from the degree of the individuals' behavioral support needs, suggesting that more efforts should be made to better understand the relationships between levels of behavioral support needs and the increased support needs resulting from those challenging behaviors. Specifically, given the fact that an individual's challenging behavior is related to his/her levels of intellectual functioning (Einfeld & Tonge, 1995), future studies need to include information about IQ or adaptive behavior so as to increase the precision of study findings. It will be critical for educational teams to understand factors that contribute to the different mean levels of support needs; to determine which subscales of support need differ depending on such factors; and to link identified support needs and evidence-based practices to assist individuals with intellectual disability to achieve their desired goals. Furthermore, support teams should consider the support needs profiles that encompass all seven support needs, including the

Protection and Advocacy Activities, when developing and implementing the individualized support plans.

In particular, this study provides transition-specific implications for adolescents or young adults with intellectual disability. The Individuals with Disabilities Education Improvement Act (2004) specifies that transition services should include "instruction, related services, community experiences, the development of employment and other post-school adult living objects, and when appropriate, acquisition of daily living skills and a functional vocational evaluation" (Sec. 1414(d)(1)(A)(i)(VIII)(bb)). One of the essential features in high-quality transition planning for youth with disabilities is to understand their strengths and needs based on the strength-based assessment approaches (Carter, Brock, & Trainor, 2012; Epstein, Rudolph, & Epstein, 2000; Neubert, 2011). The SIS-A is a strength-based assessment that focuses on an array of contextual factors so as to provide youth and young adults with adequate resources and strategies that aim to reduce and/or eliminate the gap between their capacities and environmental demands. The individualized educational teams can incorporate the SIS into students' individualized educational programs (IEPs) so that high-quality transition services are designed, implemented, and revised to meet students' transition goals. So far, several studies have documented the rationale and the potential utility of the SIS-A for the IEP process (Thompson et al., 2004b; Thompson, Wehmeyer, & Hughes, 2010), yet there is no study that examines how practitioners actually use the SIS-A as a part of the IEP in practice. Future studies should address the feasibility and impact of incorporating the SIS into the IEP process.

In sum, this study provided evidence on the relationships between individual variables and support needs. Age and gender had unique contributions to individuals' identified support needs. The data in this study also supported the underlying assumption that the co-occurrence of

intellectual disability and medical or behavioral problems influences individuals' support needs. Additionally, the underlying correlational relationships among sub-scales of the SIS were identified to create a second-order support-need construct. Given these study findings and their implications in both future research and practice, additional research is needed to further evaluate the relationship between dual-diagnosis and individuals' support needs; to examine potential contextual factors that impact support needs; to identify mediating or moderating effects on support needs; and to design, validate, and implement interventions to minimize support needs of youth and young adults with intellectual disability.

CHAPTER 3: EXAMINING UNDERLYING RELATIONSHIPS BETWEEN THE SIS FOR ADULTS AND THE SIS FOR CHILDREN

Disability-related disciplines have increasingly focused on context when conceptualizing the notion of disability over the last few decades. According to the World Health Organization's (2001) International Classification on Functioning, Disability, and Health (ICF), disability is an umbrella term that describes the limited human functioning in various life activities that require personal body functions and structures, personal activities, and participation. Within the ICF model, disability is viewed as a product of the limited interaction between an individual and that individual's contextual factors. As emphasized by Wehmeyer (2013), it is important to understand the shifting concept of disability and increasingly emphasized roles of support to assist individuals with disabilities to function successfully in their typical environments or contexts:

> These new conceptualizations of disability are strengths based, eschewing the deficits emphasis of previous models and beginning with the person's strengths, interests, and abilities to consider how to enhance personal capacity and to change the demands of the context as so to ensure that a person will be successful in typical environments. If, in fact, we can reduce and eliminate the gap between personal capacity and the demands of an environment or task, then the "disability" becomes, at the very least, irrelevant. (p.124)

The importance of contextual factors and supports, in particular, has been emphasized in the field of intellectual disability. The construct of intellectual disability is a part of the general construct of disability and requires an understanding about mutual relationships between a person and that person's environment (Schalock et al., 2010). One of the assumptions in the conceptualization of intellectual disability stems from its changeable nature; that is, disability is a state of

functioning that can be improved by appropriate personalized supports. Schalock et al. (2010) documented the reciprocal relationship between context and supports by stating that "contextualism, or the context within which supports are given, is a critical concept in understanding the current use of supports, the supports paradigm, and the influence of external factors on one's functioning" (p.18).

Shogren, Luckasson, and Schalock (2012) provided an operational definition of context as "the totality of circumstances that comprise the milieu of human life and human functioning" (as cited in Shogren, 2013, p. 133). What Shogren et al. (2012) emphasized is that context should be understood as an integrative concept that encompasses personal and environmental characteristics that are not usually manipulated (i.e., context as independent variable), as well as organizations, systems, and societal policies and practices that people can manipulate to improve human functioning (i.e., context as an intervening variable).

Context as an integrative concept provides an important implication to supports planning and delivery for people with intellectual disability: identifying support needs and embracing the identification of the support needs on top of the diagnosis and classification of intellectual disability (Hughes et al., 2011; Shogren, 2013). Traditionally, diagnosis and classification mainly focused on evaluating and classifying personal incapacity and areas of limitation, which tend to play a narrow role in planning and delivering services. What should be added is the identification of support needs that provide a framework to broaden the support provisions based on the strength-based social-ecological model. Thompson et al. (2009) described the difference between these two approaches as "what is" and "what can be," emphasizing that the focus of educational service systems has been changed to understand individuals based on their support needs instead of their deficits (p. 138).

The heart of the current research trend lies in AAIDD's initiatives to develop the *Supports Intensity Scale* (Thompson et al., 2004a) and its upgraded version, the *Supports Intensity Scale for Adults* (SIS-A) (Thompson et al., in press), so as to facilitate the measuring and planning processes of support needs that people with intellectual disability have. The SIS-A is a norm-referenced measure of support needs, where support needs is defined as "a psychological construct referring to the pattern and intensity of supports necessary for a person to participate in activities linked with normative human functioning" (Thompson et al., 2009, p. 135). The SIS-A was normed on a sample of 1,306 people with intellectual disability and related developmental disabilities 16 years and older across 33 states. The norms provide a means to compare an assessed individual's intensity of support needs against a representative sample of individuals with intellectual disability and related developmental disabilities (Thompson et al., 2004b).

The SIS-A consists of three sub-scales: The Support Need Index Scale, The Supplemental Protection and Advocacy Scale, and The Exceptional Medical and Behavioral Support Needs. A series of empirical studies have demonstrated strong psychometric properties of the SIS-A, including reliability (Thompson et al., 2004b; Thompson et al., 2008) and validity (Harries et al., 2005; Lamoureux-Hébert & Morin, 2009; Thompson et al., 2004b; Wehmeyer et al., 2009; Weiss, Lunsky, Tassé, & Durbin, 2009). Based on the empirical evidence from these studies, the SIS-A is now used for various purposes by multiple entities across the United States. Even further, the SIS-A has been translated into more than ten additional languages, including French, Italian, Catalan, Complex Chinese, Spanish, Hebrew, and Dutch (Schalock, Thompson, & Tassé, 2008; Thompson et al., 2004b).

Recently, AAIDD started to develop the *Supports Intensity Scale for Children* (SIS-C) (Thompson et al., 2012) which is designed to assess the relative intensity of support needs of children with intellectual disability between the ages of 5 and 16. The AAIDD research team is currently developing the SIS-C based on field test results from 2009. Similar to the SIS-A, the purpose of the SIS-C is to assess the pattern and intensity of support needs of children with intellectual disability. The SIS-C has many aspects in common with the SIS-A, including an administration procedure, rating system, and several common life activities. However, adjustments were made to reflect past experiences of using the SIS-A and to make the instrument items more appropriate for children in school settings. These modifications include changes to the structure of the instrument and measurement items. With regard to changed structural features, the SIS-C is composed of two sections: (a) Exceptional Medical and Behavioral Needs and (b) Supports Needs Index Scale. The assessment of exceptional medical and behavioral needs, which was placed at the end of the SIS-A, comes first for the children's version to ensure the underlying assumption that these medical conditions and challenging behaviors would require increased levels of support in addition to the support needs identified in typical daily activities (Tassé, 2011). Measurement items in the second part of the SIS-C consist of seven life activities: (a) Home Life, (b) Community and Neighborhood, (c) School Participation, (d) School Learning, (e) Health and Safety, (f) Social Activities, and (g) Advocacy. The advocacy area that is a separate subscale in the SIS-A is included in the main life activities of the SIS-C. Similar to the SIS-A, the support needs for these seven activities are examined with three measures, which are frequency, daily support time, and type of support.

In 2011, the National Center for Special Education Research (NCSER) of the Institute of Education Sciences (IES) granted a four-year study project named "Development and Validation

of the Supports Intensity Scale for Children" (Award number: R324A110177) to Vanderbilt University, Illinois State University, and the University of Kansas. This filled a need to study a broader population of children because the field tests in 2009 only included individuals from State intellectual disability/developmental disabilities (ID/DD) service systems. This project added children from school systems to ensure the SIS-C is valid and reliable in multiple contexts, including both ID/DD service systems and schools. The research team has started recruiting about 1,500 students with intellectual disability between ages 5 and 18 in school systems. The purpose of the "Development and Validation of the Supports Intensity Scale for Children" project is to (a) examine the reliability and validity of the SIS for children, (b) calibrate children's and adults' SIS scores, (c) validate items in relation to typically developing children, (d) assess ease of use and utility of the individualized education program (IEP) process, and (e) validate the assessment against student outcomes (Institute of Education Sciences [IES], 2013). The final 3,400 protocols will be used to finalize norming of the SIS-C, including 1,700 protocols collected from ID/DD service systems (not part of these IES grant activities) and 1,700 protocols accumulated from school systems (part of these IES grant activities). Authors of the SIS-C anticipate its widespread utility in both national and international entities as a primary tool to identify students' support needs in preferred life activities.

Given the fact that the SIS-C is developed on the basis of the structure and items from the SIS-A, these two measures share much in common. There also, however, exist differences in measurement items and constructs that target different age populations. Thus, the purpose of this study, as an initial investigation, is to examine similarities and differences between the SIS-A and the SIS-C to facilitate future studies. The analyses in this study address the six main questions as follows:

1. Can the construct comparability be partially established for the SIS-A and the SIS-C?
2. Are there mean level differences in common support needs when measured by the SIS-A and the SIS-C?
3. Are counterpart constructs of the SIS-A and the SIS-C highly correlated?
4. Do students' levels of intelligence and adaptive behavior impact support needs when measured by the SIS-A?
5. Do students' levels of intelligence and adaptive behavior impact support needs when measured by the SIS-C?
6. Does the latent construct consisting of intelligence and adaptive behavior have the same impact on each counterpart support need of the SIS-A and the SIS-C?

Method

Participants

The participants for this study were 142 adolescent students with intellectual disability or related developmental disabilities who completed both SIS-A and the SIS-C. Intellectual disability is defined with three criteria listed in the AAIDD 2002 definition: significant limitations in intellectual functioning, substantial limitations in adaptive behavior as expressed by conceptual, social, and practical adaptive skills, and age of onset prior to 18. As part of the aforementioned "Development and Validation of the SIS for children" study, these students were recruited from rural, urban, and suburban school districts across three states (Illinois, Tennessee, and New York). The mean age of participants at the time of interview was 18.06 years (range = 15.83 to 21.83, *SD* = 1.46). Females constituted 43.7% of the sample (*n* = 62) while males consisted of 55.6% of the sample (*n* = 79), and one participant did not indicate his/her gender

(0.7%). Disability categories were reported based on dual diagnosis, with the majority of participants being identified as intellectual disability (*n* = 123, 57.7%) or other related developmental disabilities, including autism spectrum disorder (*n* = 23, 10.8%) and speech disorder (*n* = 14, 6.6%). The majority of participants were African American (*n* = 65, 45.8%) or Caucasian (*n* = 55, 38.7%), although students from other ethnic groups were also represented in the sample.

Based on teacher estimated students' levels of intelligence (e.g., mild, moderate, severe, or profound levels of intellectual disability), 10 students (7.0%) and 11 students (7.7%) were identified as having either profound or severe intellectual disability, respectively. In addition, 51 students (35.9%) were identified as having moderate intellectual disability and 69 students (48.6%) were identified as having mild intellectual disability. One student did not have information about level of intelligence (0.7%). In terms of levels of adaptive behavior that teachers were asked to estimate (e.g., mild, moderate, severe, or profound levels of adaptive behavior), 9 students (6.3%) and 13 students (9.2%) belonged to groups of profound or severe levels of adaptive behavior, respectively. In addition, 58 students (40.8%) have moderate levels of adaptive behavior; 61 students (43.0%) have mild levels of adaptive behavior; and one student did not indicate information about level of adaptive behavior (0.7%). Table 34 provides information on other demographic characteristics of participants being rated, including child's home residence and primary language.

Table 34

Demographic Characteristics of Study Participants Being Rated

	n	*%*
States		
Illinois	14	9.9
Tennessee	96	67.6
New York	32	22.5
Gender		
Female	62	43.7
Male	79	55.6
Missing	1	0.7
Age		
15	2	1.4
16	32	22.5
17	42	29.6
18	30	21.1
19	16	11.3
20	11	7.7
21	8	5.6
Missing	1	0.7
Presence of Disability in Participant *		
Intellectual Disability	123	57.7
Low Vision/Blindness	3	1.4
Deafness/Hearing Impairment	2	0.9
Psychiatric Disability	1	0.5
Developmental Delay	4	1.9
Physical Disability (Arm & Hand limitations)	5	2.3
Physical Disability (Mobility limitations)	8	3.8
Chronic Health Condition	4	1.9
Autism Spectrum Disorder	23	10.8
Brain/Neurological Damage	3	1.4
Speech Disorder	14	6.6
Language Disorder	7	3.3
Learning Disability	3	1.4
Attention Deficit Hyperactivity Disorder	5	2.3
Other	8	3.8
Ethnicity		
Caucasian	55	38.7
African-American	65	45.8

Table 34. (cont.)

Demographic Characteristics of Study Participants Being Rated

	n	*%*
Asian/Pacific Islander	4	2.8
Hispanic	13	9.2
Multiple Ethnic Backgrounds	4	2.8
Missing	1	0.7
Student's Intelligence		
<25 or profound	10	7.0
25~39 or severe	11	7.7
40~55 or moderate	51	35.9
55~70 or mild	69	48.6
Missing	1	0.7
Student's Adaptive Behavior		
Profound	9	6.3
Severe	13	9.2
Moderate	58	40.8
Mild	61	43.0
Missing	1	0.7
Student's Home Residence		
Family Home	135	95.1
Foster Family Home	4	2.8
Small Group Home (less than 7 residents)	3	2.1
Primary Language		
English	121	85.2
Spanish	5	3.5
English and Spanish	3	2.1
Burmese	3	2.1
Arabic	2	1.4
Others (Nepalese, Farsi, Russian, Urdu, etc.)	5	3.5
Missing	3	2.1

Note. * represents dual indications.

With respect to characteristics of interviewers, the majority of interviewers were females (*n* = 106, 74.6%) and held master's degrees (*n* = 107, 75.4%). Ninety six interviewers (67.6%) were Caucasian and 82 interviewers (57.75%) have worked with individuals with intellectual or developmental disabilities for more than ten years. More information about the interviewers' demographic characteristics, including workplace location and number of years that the interviewer has known the student, is provided in Table 35.

Table 35

Demographic Characteristics of Interviewers

	n	*%*
Gender		
Female	106	74.6
Male	36	25.4
Education Level		
Bachelor Degree (BS/BA)	35	24.6
Master's Degree	107	75.4
Ethnicity		
Caucasian	96	67.6
African-American	39	27.5
Hispanic	6	4.2
Missing	1	0.7
Number of Years of Work		
Less than 3 years	1	0.7
3~5 years	35	24.6
6~10 years	24	16.9
More than 10 years	82	57.7
Workplace Location		
Urban/Suburban	128	90.1
Rural	14	9.9
Number of Years Interviewers have known the student		
Less than 1 year	3	2.1
1 ~ 2 years	52	36.6
2 ~ 3 years	45	31.7
4 years	23	16.2
5 years	7	4.9
More than 6 years	7	4.9
Missing	5	3.5

In terms of respondents, the first respondent group consisted mainly of teachers (*n* = 138, 97.2%); the second group of respondents primarily consisted of teachers (*n* = 92, 64.8%) and paraprofessionals (*n* = 34, 23.9%). The greater number of the first and second respondents have known the student for between one and three years (*n* = 98, 69 % for the first and second respondent, respectively), followed by 3 to 6 years (*n* = 36, 25.4% for the first respondent, *n* = 34, 23.9% for the second respondent). More information is presented in Table 36.

Table 36

Demographic Characteristics of Respondents

	Respondent 1		Respondent 2	
	n	%	*n*	%
Relationship to participant				
Teacher	138	97.2	92	64.8
Parent	1	0.7	1	0.7
Paraprofessional	0	0.0	34	23.9
Student	1	0.7	1	0.7
Not Specified	2	1.4	14	9.9
Number of Years Respondent has known the participant				
Less than 1 year	4	2.8	4	2.8
1 ~ 3 years (less than 3 years)	98	69.0	98	69.0
3 ~ 6 years	36	25.4	34	23.9
More than 6 years	3	2.1	3	2.1
Missing	1	0.7	3	2.1

Procedures

The dataset, as part of an ongoing Institute of Education Sciences (IES) National Center for Special Education Research Project (i.e., Development and Validation of the Supports Intensity Scale for Children) was used for this study. The process to obtain the IRB approval has been completed. Once school district-level permission was obtained and teachers who were willing to serve as interviewers were identified, the research team provided training to help

teachers accurately administer and score the two versions of the SIS. The face-to-face teacher training took place when school districts were closely located to one of the aforementioned universities. When the face-to-face training was not available, teachers obtained online training via the AAIDD website (www.aaidd.org). The content of training was based on key instructions described in the SIS *User Manual* (Thompson et al., 2004b) and the main instructions are as follows:

1. This scale should be completed without regard to the services or supports currently provided or available.
2. Scores should reflect supports that would be necessary for this person to be successful in the activity.
3. If an individual uses assistive technology, the person should be rated with said technology in place.
4. Raters should complete all items, even if the person is not currently performing a listed activity (Thompson et al., 2004b, p. 25).

Teachers received fifty dollars in compensation for their responsibilities to recruit students, obtain consent forms, arrange interviews, conduct interviews assuring the fidelity of data collection procedures, and return the completed protocol to the research team.

Measurements

The Supports Intensity Scale for Adults. The SIS-A measures the pattern and intensity of support needs of individuals with intellectual disability who are 16 to 64 years old. The SIS-A consists of three sections: Support Needs Index Scale, Supplemental Protection and Advocacy Scale, and Exceptional Medical and Behavioral Support Needs. The first section, Support Needs Index Scale, includes 49 items that evaluate support needs across six life activities: Home Living,

Community Living, Lifelong Learning, Employment, Health and Safety, and Social. Scores from these six domains are used to compute a SIS Support Needs Index, the composite standard score, to present an overall standardized indication of the intensity of support needs that each individual has (Thompson et al., 2004b). Furthermore, six standard scores calculated from six life activities are helpful to provide a profile of support needs that an individual has. The second section, Supplemental Protection and Advocacy Scale, includes 8 items of protection and advocacy related activities. Items in both the first and second subscales are examined by three measures of support needs: (a) frequency, (b) daily support time, and (c) type of support. Frequency refers to how often support is required for each specific activity. Frequency is primarily rated on a 0 to 4 scale as a higher score shows the greater support needs. However, some items are measured by either 0 to 3 levels or 0 to 2 levels, within the 0 to 4 scale, due to unique nature that particular items are asking, and those items are indicated with cross-out squares in the instrument. Daily support time (DST) is related to the amount of time needed to support the provision when the support is offered. Similar to frequency, DST is evaluated on a 0 to 4 scale with exceptions of three items that cannot be evaluated with 0 to 4 levels. Type of support examines the nature of support that a person needs to participate in the activity in question and is rated by a 0 to 4 scale without any items excepted. The last section, Exceptional Medical and Behavioral Support Needs, includes 15 medical and 13 behavioral items that are essential when considering individuals' comprehensive support needs. The exceptional support needs are evaluated by a 0 to 2 scale. Appendix B shows expanded descriptions of items listed in the SIS-A, as well as the initial descriptions of items.

The Supports Intensity Scale for Children. Similar to measuring support needs for Adults, the SIS for Children is designed to measure the intensity of support needs for children

with intellectual disability ages 5 to 16. The SIS-C consists of seven life activities that are used to create a SIS Support Needs Index, including advocacy-related activities that were left out in the SIS-A. The total 61 items listed in these seven activities are evaluated with three methods: frequency, daily support time, and type of support. Like the SIS-A, these three methods are rated by a 0 to 4 scale with a higher score representing greater support needs. The seven subscales were examined to evaluate the inter-rater reliability and the corresponding Pearson correlation coefficients are as follows: Home Living Activities (r = .97); Community and Neighborhood Activities (r = .86); School Participation Activities (r = .88); School Learning Activities (r = .94); Health and Safety Activities (r = .90); Social Activities (r = .81); and Advocacy Activities (r = .81) (Thompson, Wehmeyer, Patton, Schalock & Tassé, 2009). Based on Cicchetti and Sparrow's (1981) guidelines for evaluating reliability coefficients, all subscale coefficients remained in the excellent range (.75 or above). In addition to these seven subscales, there are 17 medical items and 14 behavioral items that are measured on a 0 to 2 scale: "0 = *no support needed*; 1 = *some support needed* (i.e., providing monitoring and/or occasional assistance); 2 = *extensive support needed* (i.e., providing regular assistance to manage the medical condition or behavior)" (Thompson et al., 2012, p.5). The field test version 3.0 for the SIS-C is provided in the Appendix D. Table 37 provides comparisons of the SIS-A and the SIS-C.

Table 37

The Comparison of the SIS for Adults and the SIS for Children

	The SIS for Adults	The SIS for Children
Ages of target individuals	ages 16 to 64	ages 5 to 16
General organization	Three sections 1. The Support Needs Index Scale (49 items and 6 subscales) 2. Supplemental Protection and Advocacy Scale (8 items) 3. Exceptional Medical and Behavioral Support Needs (15 items for medical condition and 13 items for behavioral problem)	Two sections 1. Exceptional Medical and Behavioral Needs (17 items for medical condition and 14 items for behavioral problem) 2. The Support Needs Index Scale (61 items and 7 subscales)
The Support Needs Index Scale	49 Items (6 constructs) 1. Home living activities 2. Community living activities 3. Lifelong learning activities* 4. Employment activities* 5. Health and safety activities 6. Social activities	61 Items (7 constructs) 1. Home life activities 2. Community and neighborhood activities 3. School participation activities* 4. School learning activities* 5. Health and safety activities 6. Social activities 7. Advocacy activities
Levels of the rating for subscales (The Support Needs Index Scale)	1. Frequency: varies upon each instrument item 2. Daily Support Time: varies upon each instrument item 3. Type of Support: 0 to 4	1. Frequency: 0 to 4 2. Daily Support Time: 0 to 4 3. Type of Support: 0 to 4

Note. * represent different counterpart constructs.

Analytic Procedures

Structural equation modeling (SEM) was used to address research questions in this study. SEM has great flexibility in testing research hypotheses, and success in SEM depends on the theoretical foundations that underlie models to be tested (Kline, 2011; Little, 2013). Specifically, SEM includes both measurement and structural models; measurement models examine the relationships among manifest variables and underlying latent variables, and structural models indicate the relationships among underlying latent variables. Mplus version 7.0 (Muthén & Muthén, 2012) was used for the following data analyses. A priori level of significance was set at alpha level .05 throughout this study.

Pre-modeling steps. Data screening and data preparation procedures were completed as pre-modeling steps. First, proportion of maximum scoring (POMS) was used to transform the variables, by keeping the shape of the distribution or the magnitude of an association between any of the variables the same (Little, 2013). Even though items of the SIS-C are measured on the same 0 to 4 scale, it was necessary to rescale data to compare items from the SIS-C and those from the SIS-A because some of the items on the SIS-A had options blocked depending on the unique nature items were measuring. One of such examples is the item listed in Employment Activities, *Changing job assignment*. It is not realistic to expect that a person would need supports to change his/her job assignments hourly (frequency level: 4) or at least once a day (frequency level: 3) in employment settings; thus, levels from 0 (i.e., none or less than monthly) to 2 (i.e., at least once a month, but not once a week) are only options available for this item. Similarly, people do not expect that supports for *Participating in training/educational decisions* in Lifelong Learning Activities would be provided for 4 hours or more (daily support time level: 4); therefore, this item, *Participating in training/educational decisions,* has levels from 0 (i.e.,

none) to 3 (i.e., 2 hours to less than 4 hours) in the daily support time dimension of support needs. POMS was computed by (the observed score for each question – the minimum possible score on the measurement)/(the maximum possible score on the measurement – the minimum possible score on the measurement) (Cohen et al., 1999). Rescaled variables, then, were averaged across three dimensions of the SIS for each item in each subscale (i.e., frequency, daily support time, and type of support).

Second, a series of the item-comparison process was conducted to systematically examine similarities and/or differences of items and constructs across the two versions of the SIS. The SIS-C includes some age-appropriate modifications in comparison with the SIS-A. As seen Table 37, the distinct differences between the two scales are two respective support needs that measure different constructs (i.e., Lifelong Learning Activities and Employment Activities for the SIS-A, School Participation Activities and School Learning Activities for the SIS-C). Even within the same counterpart constructs, there are some modifications at the item level.

To systematically examine whether counterpart items in both scales carry the same information across the two versions of the SIS (e.g., housekeeping and cleaning from the SIS-A versus completing household chores from the SIS-C), the following steps were completed. Two doctoral students in the special education program at the University of Kansas conceptually arranged counterpart items that are likely to measure the same information, including identically described items, and compared their results. If there were any disagreements, a discussion to reach consensus followed. Then, the measurement invariance tests that include configural, weak, and strong invariance models were conducted to determine whether selected items had the equivalent information across the two versions of the SIS (the detailed explanation of measurement invariance tests follows in the next section). Once the counterpart items that held

the same information across the two versions of the SIS were identified, parcels were created for those items using the item-to-construct balancing technique (Little et al., 2002). The advantages of parceling include higher reliability, greater communality, lower likelihood of distributional violations, fewer parameter estimates, lower changes for correlated residuals or dual loadings of indicators, and reduced sources of sampling error (Little, 2013). The created parcels that are equivalent across both versions of the SIS and the rest indicators that are not common served as manifest variables for each construct. There was no missing data found after generating parcels for each construct.

Testing measurement parameters. After data preparation was completed, a test of the measurement model that explains relationships between manifest variables and latent constructs was conducted. Since the number of items in each counterpart construct was not always the same, residual-centered phantom indicators were created to match the number of indicators so that the partial factorial invariance models can be tested. To generate residual-centered phantom indicators that are not correlated with other indicators in the model, a series of steps were needed. The randomly generated data was created and regressed on all other indicators in the model. At the same time, the residuals for these regressions were saved and finally used as residual-centered phantom indicators. It is important to fix factor loadings and intercepts of residual-centered phantom indicators as zero and set them not be equated when conducting invariance tests (Figure 6). In addition, modeling residual-centered phantom indicators requires a correction to the null and target models' degrees of freedom (*df*) and fit indices (i.e., RMSEA, CFI, and TLI) when interpreting results (Geldhof, Pornprasertmanit, Schoemann, & Little, 2013).

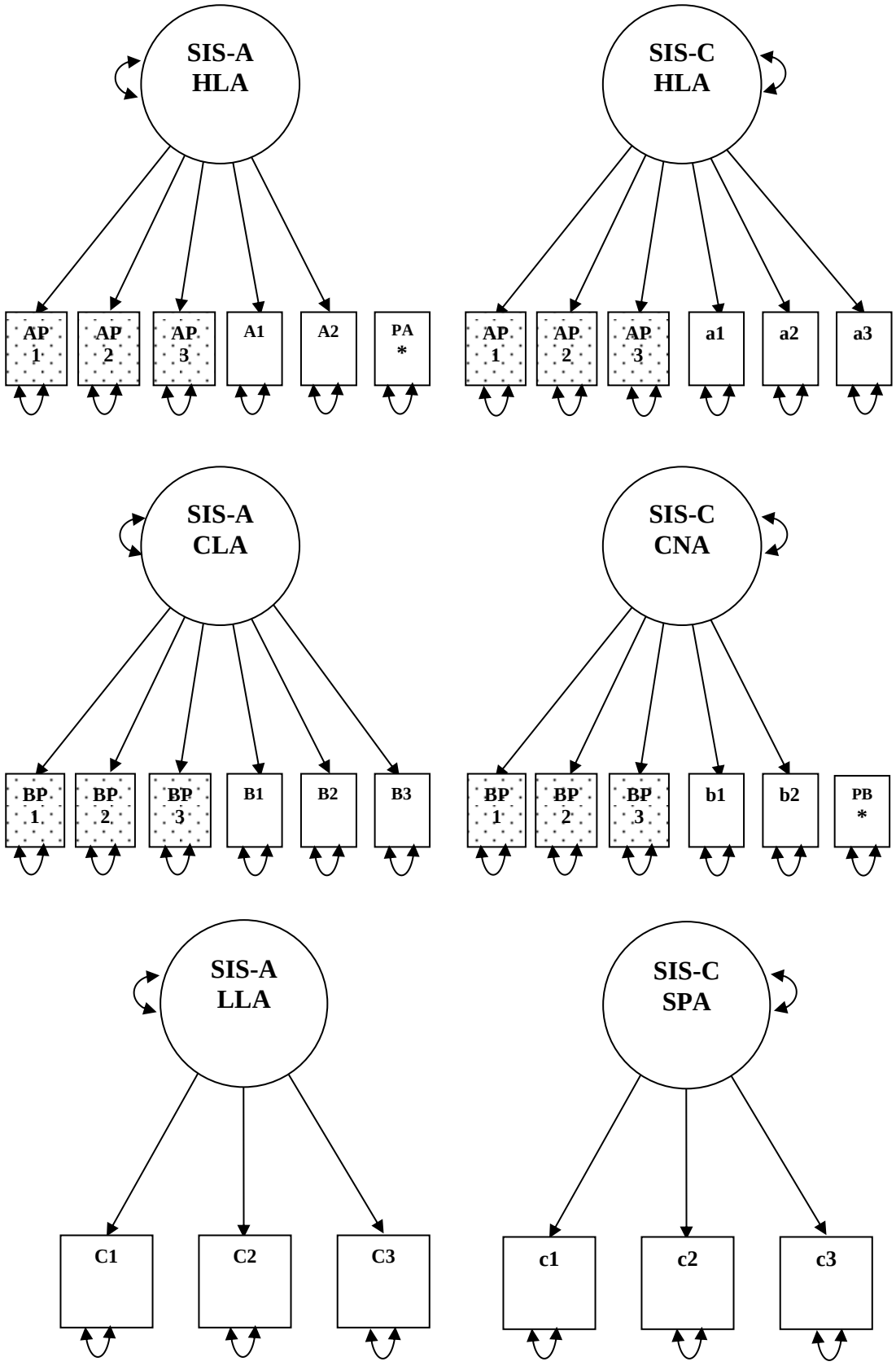
The next step was to run partial factorial invariance models that include configural, weak factorial, and strong factorial invariance to examine underlying relationships across the two

versions of the SIS. The configural invariance was examined by specifying the same pattern of fixed and freed parameters for each measure. The weak invariance test was performed by constraining corresponding factor loadings for each construct equal across each SIS; and the strong invariance test was conducted by equating the corresponding intercepts across the two versions of the SIS to examine the observed means and estimated intercepts of indicators (Brown, 2006; Little, 2013). Partial factorial invariance models were run because the target models included three residual-centered phantom indicators as well as different indicators that do not have the same information across the two versions of the SIS, which cannot be constrained as equal. To provide meaningful interpretations, the effects-coding method was used when setting the scale, making the average of parcel's loading equal to 1.0 and the average of intercepts equal to 0 (Little et al., 2006). Once the measurement models were specified, correlations between counterpart constructs across the two versions of the SIS were examined.

Testing latent parameters. After the partial factorial invariance models were established, the equality of factor variances/covariances and the equality of latent means were tested to examine latent parameters. The equality of factor variances and covariances was examined by performing the nested chi-square test that keeps the strong invariance model as a baseline model. Likewise, the equality of latent means was tested to identify the difference in constructs' average mean by conducting the nested chi-square test with the same baseline model.

Tests of the structural model that represent underlying relationships among latent constructs were conducted to examine the effects of individuals' intelligence and adaptive behavior on support needs. Specifically, a new latent construct that contains information about individuals' levels of intelligence and adaptive behavior was created to analyze the degree to which it predicts support needs measured by the SIS-A and the SIS-C, respectively. The newly

created construct is due to the multicollinearity that is resulted from the high correlation between levels of intelligence and adaptive behavior (r = 0.86). Profound/severe intelligence and adaptive behavior groups were also created due to the small number of students with profound or severe levels of intelligence and adaptive behavior, respectively. Figure 7 and Figure 8 display hypothesized structural models of the SIS-A and the SIS-C, respectively. The last research question that compares the counterpart regression paths across the two versions of SIS was examined by performing likelihood ratio tests (i.e., the change in χ^2).


SIS-A
HLA
AP 1
AP 2
AP 3
A1
A2
PA *
SIS-C
HLA
AP 1
AP 2
AP 3
a1
a2
a3
SIS-A
CLA
BP 1
BP 2
BP 3
B1
B2
B3
SIS-C
CNA
BP 1
BP 2
BP 3
b1
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PB *
SIS-A
LLA
C1
C2
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SIS-C
SPA
c1
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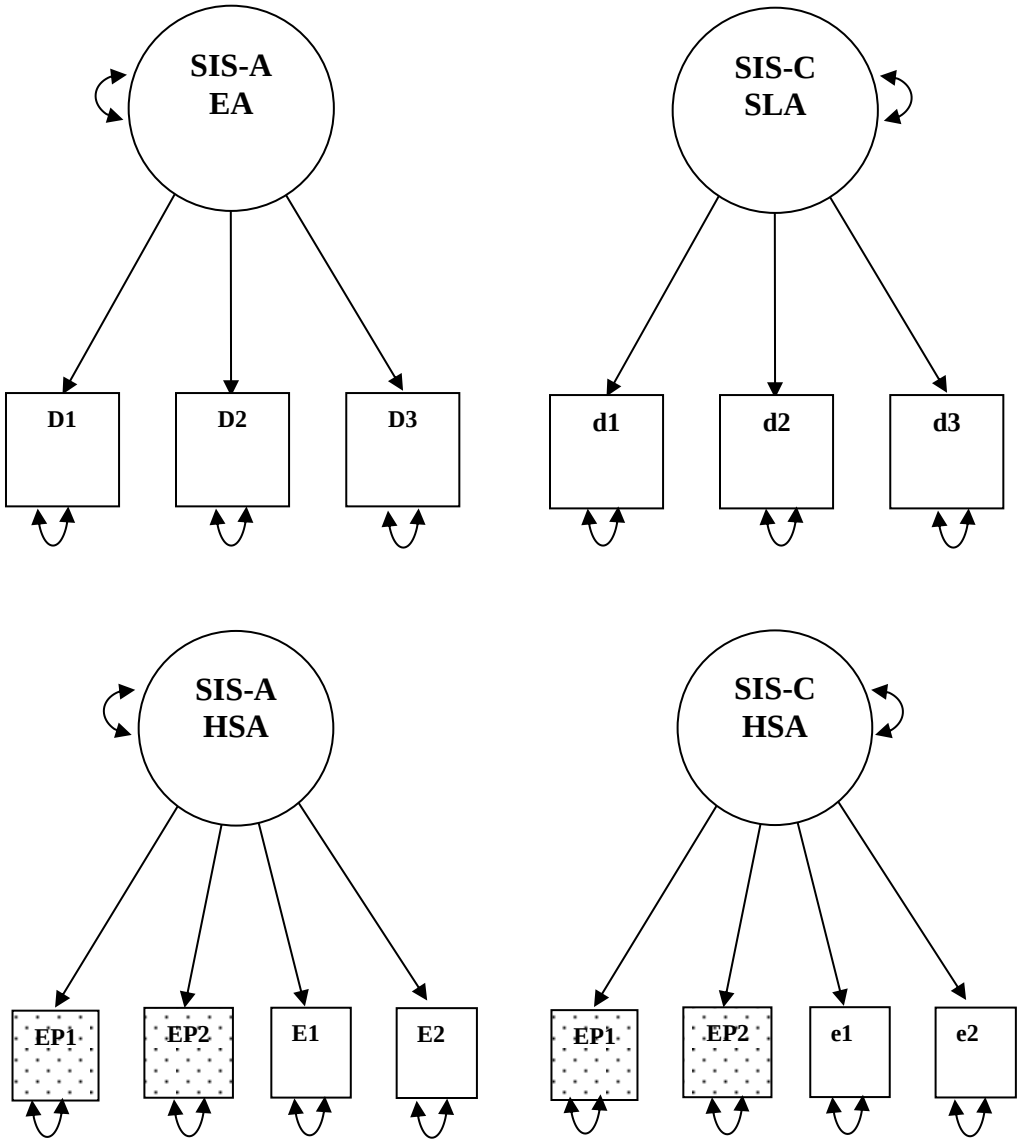
SIS-A
EA
D1
D2
D3
SIS-C
SLA
d1
d2
d3
SIS-A
HSA
EP1
EP2
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E2
SIS-C
HSA
EP1
EP2
e1
e2

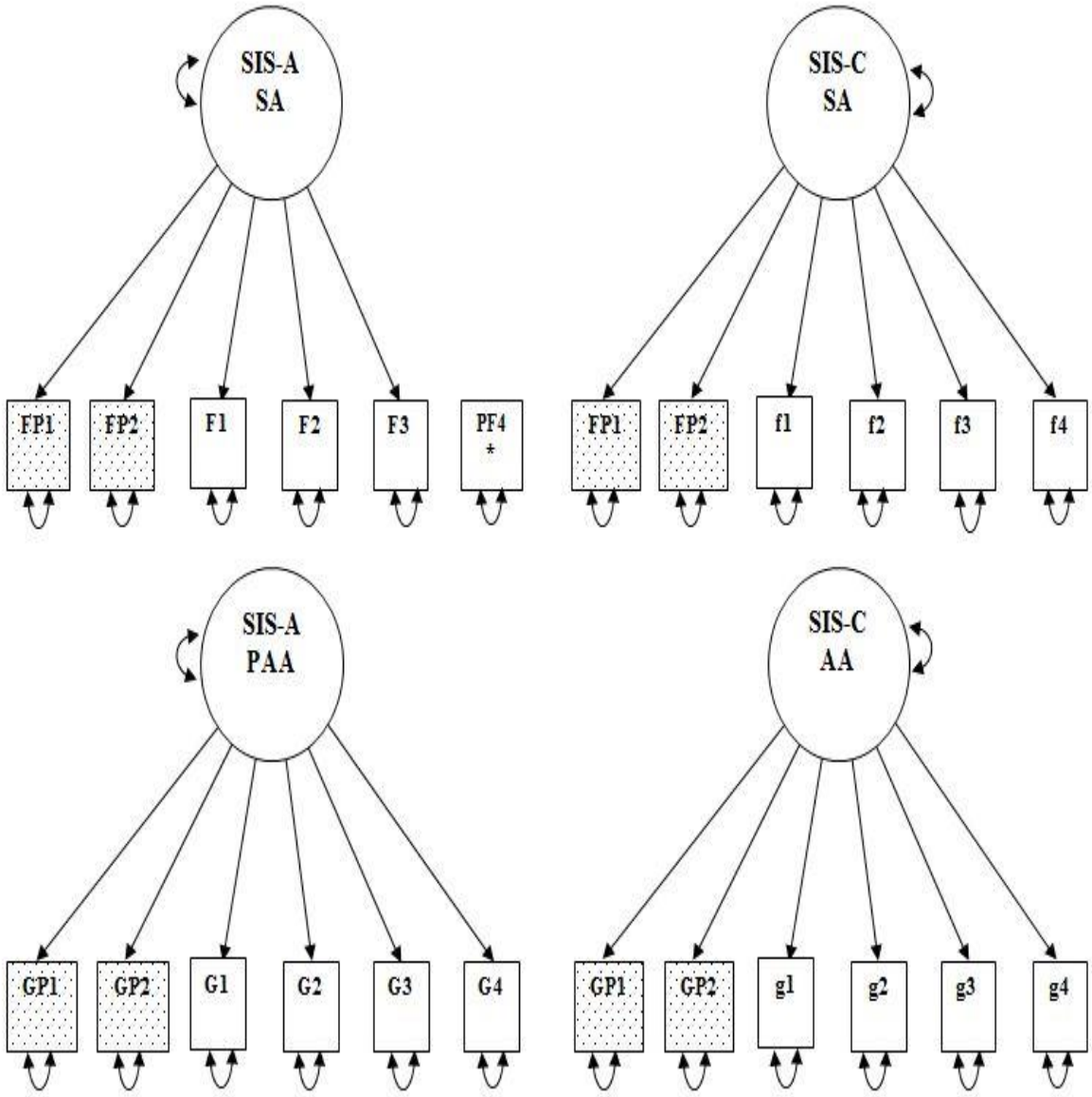

Figure 6. The measurement models of the SIS for Adults and the SIS for Children. Equivalent manifest variables across the two versions of the SIS are indicated by dots. Each phantom indicator does not load onto corresponding construct. Phantom indicators are presented with *. HLA = home living activities; CLA = community living activities; CNA = community and neighborhood activities; LLA= lifelong learning activities; SPA = school participation activities; EA= employment activities; SLA = school learning activities; HSA = health and safety activities; SA = social activities; PAA = protection and advocacy activities; and AA = advocacy activities.

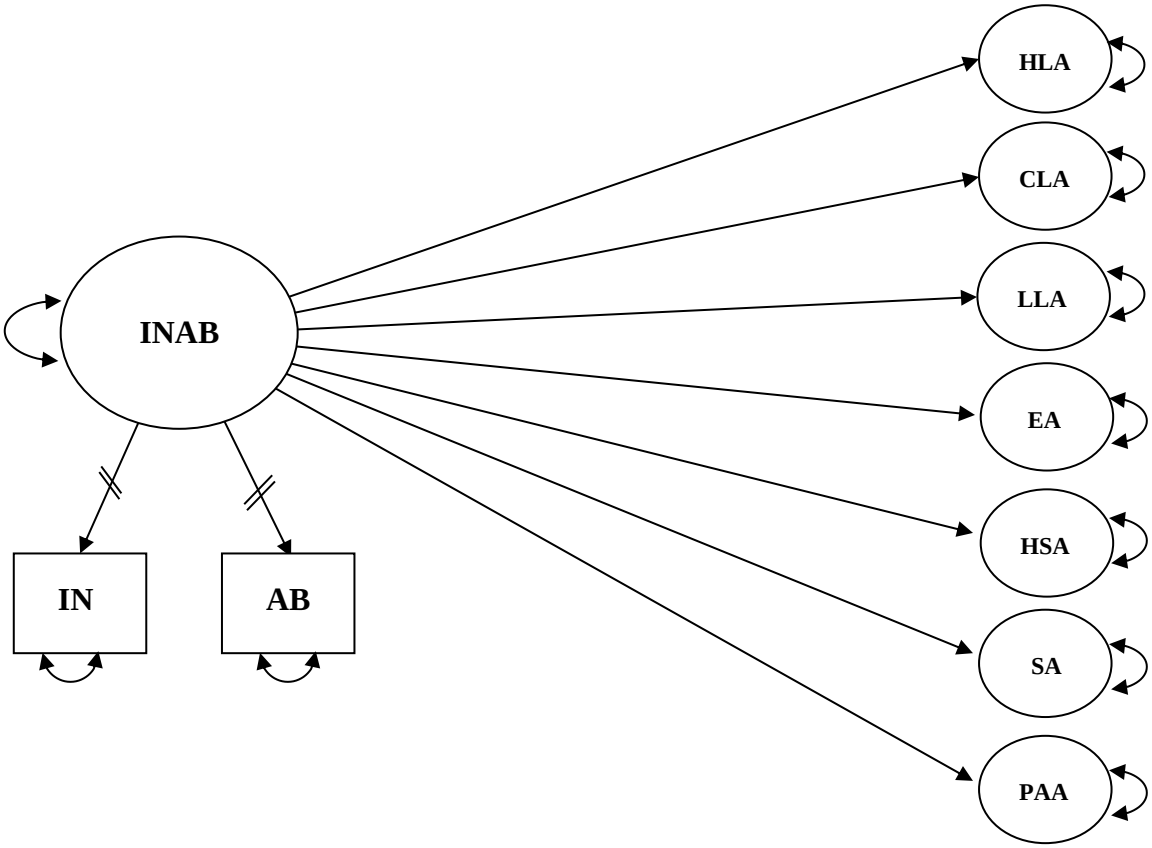

Figure 7. Hypothesized structural model of the SIS for Adults. Correlations among factors are not presented due to limited space. INAB= intelligence and adaptive behavior; IN = intelligence; AB = adaptive behavior; HLA = home living activities; CLA = community living activities; LLA= lifelong learning activities; EA= employment activities; HSA = health and safety activities; SA = social activities; and PAA = protection and advocacy activities.

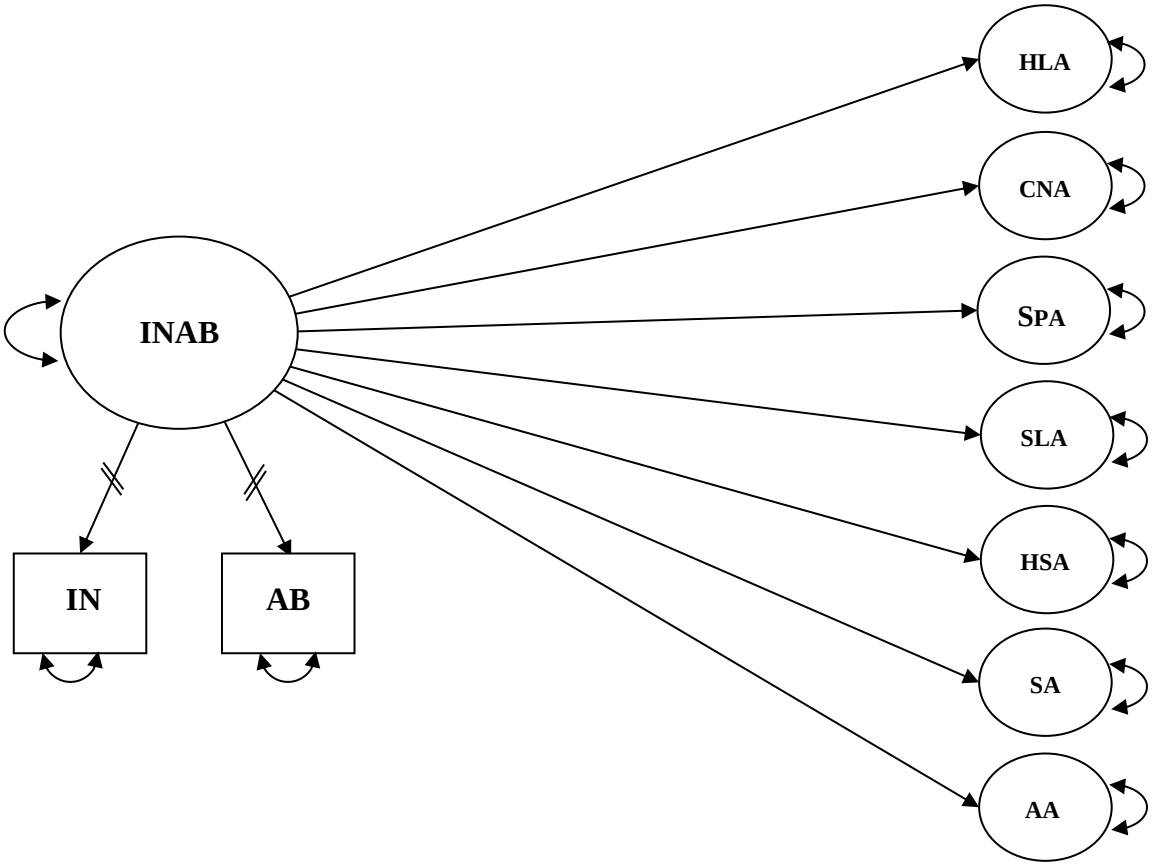

Figure 8. Hypothesized structural model of the SIS for Children. Correlations among factors are not presented due to limited space. INAB= intelligence and adaptive behavior; IN=intelligence; AB=adaptive behavior; HLA= home living activities; CNA=community and neighborhood activities; SPA= school participation activities; SLA= school learning activities; HSA= health and safety activities; SA=social activities; and AA= advocacy activities.

Results

Table 38 provides the item-level comparison between the SIS for Adults and the SIS for Children. The highlighted indicators turned out to measure the same information across the two versions of the SIS. Results from measurement invariance tests that only include common constructs and indicators across both versions of the SIS are provided in Table 39. The configural invariance model was acceptable based on following fit indices: χ^2 (398) = 1241.719, RMSEA = .122 $_{(.115 - .130)}$, CFI = .905, and TLI = .890, indicating that the highlighted indicators

Table 38

Item-Level Comparisons between the SIS for Adults and the SIS for Children

	The SIS for Adults	The SIS for Children
PART A: Home Living Activities		**PART A: Home Life Activities**
Parcels	Indicators	Indicators
AP1	6. Dressing	4. Dressing
	8. Operating home appliances	9. Operating electronic devices
AP2	7. Bathing and taking care of personal hygiene and grooming needs	3. Washing and keeping self-clean
	5. Housekeeping and cleaning	1. Completing household chores
AP3	1. Using the toilet	5. Using the toilet
	4. Eating food	2. Eating
	2. Taking care of clothes	6. Sleeping and/or napping
	3. Preparing food	7. Keeping track of personal belongs at home
	* Phantom indicator	8. Keeping self-occupied during unstructured time at home
PART B: Community Living Activities		**PART B: Community and Neighborhood Activities**
BP1	5. Participating in preferred community activities	5. Participating in community service and religious activities
BP2	3. Using public services in the community	4. Using public services in one's community or neighborhood
	1. Getting from place to place throughout the community	1. Moving around the neighborhood and community
BP3	2. Participating in recreation activities	2. Participating in leisure activities (physical)
		3. Participating in leisure activities (non-physical)
	6. Shopping and purchasing goods and services	6. Shopping
	8. Accessing public buildings and settings	8. Attending special events in the community or neighborhood
	4. Going to visit friends and family	7. Complying with basic community standards, rules, and/or laws
	7. Interacting with community members	* Phantom indicator

Table 38. (cont.)

Item-Level Comparisons between the SIS for Adults and the SIS for Children

The SIS for Adults	The SIS for Children
PART C: Lifelong Learning Activities	**PART C: School Participation Activities**
1. Interacting with others in learning activities	1. Being included in general education classrooms
2. Participating in training/educational decisions	2. Participating in activities in common school areas (e.g., playground, hallways, cafeteria)
3. Learning and using problem-solving strategies	3. Participating in co-curricular activities
4. Using technology for learning	4. Getting to school (includes transportation)
5. Accessing training/educational settings	5. Moving around within the school and transitioning between activities
6. Learning functional academics (reading signs, counting change, etc.)	6. Participating in large-scale test taking activities required by state education systems
7. Learning health and physical education skills	7. Following classroom and school rules
8. Learning self-determination skills	8. Keeping track of personal belongings at school
9. Learning self-management strategies	9. Keeping track of schedule at school
PART D: Employment Activities	**PART D: School Learning Activities**
1. Accessing/receiving job/task accommodations	1. Accessing grade level curriculum content
2. Learning and using specific job skills	2. Learning academic skills
3. Interacting with co-workers	3. Learning and using metacognitive strategies
4. Interacting with supervisors/coaches	4. Completing academic tasks (e.g., time, quality, neatness, and organizational skills)
5. Completing work-related tasks with acceptable speed	5. Learning how to use and using educational materials, technologies, and tools
6. Completing work-related tasks with acceptable quality	6. Learning how to use and using problem solving and self-regulation strategies in the classroom
7. Changing job assignments	7. Participating in classroom level evaluations, such as tests
8. Seeking information and assistance from an employer	8. Accessing the health and physical education curricula
	9. Completing homework assignments

Table 38 (cont.)

Item-Level Comparisons between the SIS for Adults and the SIS for Children

	The SIS for Adults	The SIS for Children
PART E: Health and Safety Activities		**PART E: Health and Safety Activities**
EP1	2. Avoiding health and safety hazards	8. Avoiding health and safety hazards
	7. Maintaining physical health and fitness	2. Maintaining physical fitness
EP2	8. Maintaining emotional well-being	3. Maintaining emotional well-being
	6. Maintaining a nutritious diet	4. Maintaining health and wellness
	5. Learning how to access emergency services	5. Implementing routine first aid when experiencing minor injuries
	1. Taking medications	7. Protecting self from physical, verbal, and/or sexual abuse
	3. Obtaining health care services	6. Responding in emergency situations
	4. Ambulating and moving about	1. Communicating health related issues and medical problems
PART F: Social Activities		**PART F: Social Activities**
FP1	4. Making and keeping friends	6. Making and keeping friends
	7. Engaging in loving and intimate relationships	1. Maintaining positive relationships with others
FP2	5. Communicating with others about personal needs	7. Communicating with others in social situations
	6. Using appropriate social skills	8. Respecting others personal space/property
	1. Socializing within the household	2. Respecting the rights of others
	3. Socializing outside the household	
	2. Participating in recreation/leisure activities with others	3. Maintaining conversation
	8. Engaging in volunteer work	5. Coping with changes in routines and transitions
	* Phantom indicator	4. Responding to and providing constructive criticism
		9. Protecting self from exploitation and bullying

Table 38 (cont.)

Item-Level Comparisons between the SIS for Adults and the SIS for Children

	The SIS for Adults	The SIS for Children
PART G: Protection and Advocacy Activities		**PART G: Advocacy Activities**
GP1	7. Making choices and decisions	4. Making choices and decisions
GP2	8. Advocating for others	5. Advocating for and assisting others
	1. Advocating for self	6. Learning and using self-advocacy skills
	5. Belonging to and participating in self-advocacy/support organizations	8. Participating in educational decision making
	2. Managing money and personal finances	1. Expressing preferences
		7. Communicating personal wants and needs
	3. Protecting self from exploitation	2. Setting personal goals
		3. Taking action and attaining goals
	4. Exercising legal responsibilities	9. Learning and using problem solving and self-regulation strategies in the home and community
	6. Obtaining legal services	

Note. Highlighted indicators are the same between two versions of the SIS. Created parcels using highlighted indicators (e.g., AP1) are presented in Figure 6.

Table 39

Fit Indices for the Nested Sequence for Initial Measurement Invariance Tests

Model	χ^2	*df*	*p*	RMSEA	RMSEA 90% CI	CFI	TLI	Constraint Tenable
Null Model	9385.747	462	0.00	---	---	---	---	---
Configural Invariance[1]	1241.719	398	0.00	0.122	.115-.130	.905	.890	---
Weak Invariance[1]	1260.046	415	0.00	0.120	.112-.127	.905	.895	Yes
Strong Invariance[1]	1370.799	432	0.00	0.124	.116-.131	.895	.887	Yes

Note. Each nested model contains its constrains, plus the constraints of all previous, tenable models. For the measurement model tests of invariance, a change in CFI of .01 or less is used.
[1] Evaluated with RMSEA and CFI Model Test

in Table 38 have the same pattern of fixed and freed parameters for each support-need construct. The weak and strong factorial invariances were also established, representing that common indicators' factor loadings and intercepts for each construct were identical across the two versions of the SIS. The practical guideline to determine measurement invariance was a value of ΔCFI that is smaller than or equal to 0.01 (Cheung & Rensvold, 2002). Once common counterpart indicators were identified, parcels were created using the item-to-construct balancing approach (see Table 38 and Figure 6). Those parcels and the rest of the indicators that do not hold the same information across both versions of the SIS served as manifest variables for each construct.

The results from partial factorial invariance tests that include equivalent constructs and indicators, as well as distinct constructs and indicators are provided in Table 40. The distinct constructs and indicators, including phantom indicators, were not equated when testing measurement invariance. As described earlier, degrees of freedom corrections were required to

interpret results since each phantom indicator, three phantom indicators in total in this study, was purposefully created orthogonal to the five true indicators in each relevant construct. That is, the model's overall degrees of freedom include 15 inflated elements that are not free to vary. Accordingly, fit indices (i.e., RMSEA, CFI, and TLI) were recalculated based on the corrected degrees of freedom that do not have 15 degrees of freedom in both the fitted and null models (Geldhof et al., 2013; Hu & Bentler, 1998).

The partial configural model that allowed a correlation between two uncommon indicators of the Protection and Advocacy Activities in the SIS-A was acceptable based on the following fit indices: χ^2 (1017) = 2538.823, *df*-corrected RMSEA = .104, *df*-corrected CFI = .905, and *df*-corrected TLI = .895. Weak invariance was tested by equating all factor loadings across the two scales, except for the uncommon constructs and indicators. Based on Cheung and Rensvold (2002)'s criterion (i.e., Δ CFI$\leq$ .01), the weak invariance was established (Δ*df*-corrected CFI = .001). Using the same criterion, strong invariance was also supported by equating all intercepts across the two scales, excluding uncommon constructs and indicators (Δ*df*-corrected CFI = .003).

As seen in Table 40, the homogeneity of variances/covariances was not tenable based on the nested chi-square test by setting the strong invariance model as a baseline model ($\Delta\chi^2$ (15) = 44.782, $p < .0001$). The heterogeneity of variances/covariances indicates that the relations among the latent constructs are significantly different within and between scales, which provides the basis to run two separate SEM models to evaluate the effects of a latent construct that contains scores of individuals' IQs and adaptive behaviors on each support need (Little, 2013). As seen in Table 44, the data supported that the combined scores of IQ and adaptive behavior

negatively predict all support needs in both versions of the SIS. More detailed explanations of these regression analyses will be followed.

In comparing latent means that only contain the same indicators (i.e., highlighted indicators in Table 38), the equality of latent means was tested by incorporating the combined IQ and adaptive behavior scores as a covariate so as to control for its significant impact on each latent construct. As seen in Table 40, the nested chi-square test indicated that the average latent mean is not the same across the two versions of the SIS ($\Delta\chi^2$ (5) = 51.389, $p < .0001$). The follow-up individual mean comparisons were conducted to identify which constructs have different means between these two scales. The results from nested chi-square tests in Table 41 indicated that Community Living-Related Activities, Health and Safety Activities, and Social Activities have unequal latent means between the two versions of the SIS (Community Living-Related Activities: $\Delta\chi^2$ (1) = 8.386, $p < .05$; HSA: $\Delta\chi^2$ (1) = 36.222, $p < .0001$; and SA: $\Delta\chi^2$ (1) = 19.456, $p < .0001$).

As seen in Table 42, the data indicated that our sample had lower support needs in the children's version than the adults' version in areas of Community Living Related Activities and Social Activities. However, the sample used in this study appeared to have more support needs in the children's version than the adults' version in Health and Safety Activities. To identify the magnitudes of these latent mean differences, the effect sizes were computed. Based on the Cohen (1988)'s criterion that determine small, medium, and large effect sizes as .20, .50, and .80 respectively, Community Living-Related Activities and Social Activities had quite small effect sizes (d = 0.033 and d = 0.127, respectively). The effect size of Health and Safety Activities was 0.298, which also demonstrated the small effect size (Table 41).

Table 40

Fit indices for the Nested Sequence for Partial Measurement Invariance Tests

		Uncorrected					Corrected							
Model	χ^2	*df*	*p*	RMSEA	CFI	TLI	$\Delta\chi^2$	*df*	Δdf	*p*	RMSEA	CFI	TLI	Constraint Tenable
Null Model	17262.574	1122	.00	---	---	---	---	1107	---	---	---	---	---	---
Configural [1]	2696.124	1018	.00	.108	.896	.885	---	1003	---	---	0.109	.895	.884	---
Partial configural[1]	2538.823	1017	.00	.103	.906	.896	---	1002	---	---	0.104	.905	.895	Yes
Weak [1]	2557.922	1024	.00	.103	.905	.896	---	1009	---	---	0.104	.904	.895	Yes
Strong [1]	2622.480	1031	.00	.104	.901	.893	---	1016	---	---	0.106	.901	.892	Yes
Strong with covariate[1]	2862.481	1155	.00	.102	.897	.887	---	1140	---	---	0.104	.893	.896	Yes
Homogeneity of Var/Cov[2]	2667.262	1046	.00	---	---	---	44.782	1031	15	<.0001	---	---	---	No
Latent Mean[2]	2674.517	1036	.00	---	---	---	52.037	1021	5	<.0001	---	---	---	No
Latent mean with covariate[2]	2913.870	1160	.00	---	---	---	51.389	1145	5	<.0001	---	---	---	No

Note. Each nested model contains its constrains, plus the constraints of all previous, tenable models.
[1] Evaluated with CFI Model Test; a change in CFI of .01 or less is used.
[2] Evaluated with χ^2 Different Test using the corrected *df*.

Table 41

Tests of the Latent Means

Model	χ^2	*Corrected df*	*P*	$\Delta\chi^2$	*Corrected* Δ *df*	*p*	Constraint Tenable	Effect Size[1]
Strong Invariance with Covariate (Baseline Model)	2862.481	1140	.00	---	---	---	---	---
Latent Mean Invariance with Covariate	2913.870	1145	.00	51.389	5	<.0001	No	---
Home Living-Related Activities	2911.892	1144	.00	1.978	1	0.1055	Yes	---
Community Living-Related Activities	2905.484	1144	.00	8.386	1	0.0021	No	0.033
Health and Safety Activities	2877.648	1144	.00	36.222	1	<.0001	No	0.298
Social Activities	2894.414	1144	.00	19.456	1	<.0001	No	0.127
Protection and Advocacy-Related Activities	2912.990	1144	.00	0.880	1	0.2739	Yes	---

Note. [1] Effect size is latent *d*, where $d = (\alpha_2-\alpha_1)/\sqrt{\frac{(n_1 * \psi_1 + n_2 * \psi_2)}{n_1 + n_2}}$; α_2 and α_1 are the estimated means in latent variable metric; n_2 and n_1 are the sample size for each group; ψ_2 and ψ_1 are the estimated latent variances of the distributions around the latent means of α_2 and α_1, respectively. χ^2 = chi-square value; *df* = degrees of freedom; *p* = *p* value; $\Delta\chi^2$ = changes in chi-square values.

Table 42

Estimated Latent Means

Constructs	The SIS for Adults		The SIS for Children	
	M	*SE*	*M*	*SE*
Community Living-Related Activities	2.399	0.159	2.225	0.154
Health and Safety Activities	1.828	0.134	2.124	0.150
Social Activities	2.071	0.152	1.763	0.142

Note. Unstandardized values are presented.

In looking at underlying correlations between constructs across the two versions of the SIS, every correlation was significant at the 0.001 level (Table 43). In particular, the counterpart constructs between the two versions of the SIS demonstrated strong correlations: Home Living-Related Activities (r = 0.838), Community Living-Related Activities (r = 0.822), Health and Safety Activities (r = 0.844), Social Activities (r = 0.812), and Advocacy-Related Activities (r = 0.761). The highest correlation was found in Health and Safety Activities (r = 0.844), accounting for about 71% of variance between the two scales. The lowest correlation, however, was found in Advocacy-related Activities (r = 0.761), explaining that about 58% of variance is shared between two instruments.

Lastly, in examining the effects of personal capacities (i.e., IQ and adaptive behavior scores) on support needs, the data suggested that the combined scores of IQ and adaptive behavior negatively predicted all support needs measured by both versions of the SIS (Table 44). That is, as individuals have higher levels of IQs and adaptive behaviors, they tend to have fewer support needs. The nested chi-square tests were conducted to identify the degrees to which these causal relationships were the same across the two scales, by setting the structural model that keeps both IQ and adaptive behavior variables as a baseline model. As seen in Table 45, the

impacts of IQ and adaptive behavior on each counterpart constructs were the same between the SIS-A and the SIS-C: Home Living-Related Activities ($\Delta \chi^2$ (1) = 0.907, $p > .05$), Community Living-Related Activities ($\Delta \chi^2$ (1) = 3.186, $p > .05$), Health and Safety Activities ($\Delta \chi^2$ (1) = 2.128, $p > .05$), Social Activities ($\Delta \chi^2$ (1) = 0.184, $p > .05$), and Advocacy-Related Activities ($\Delta \chi^2$ (1) = 0.736, $p > .05$).

Table 43

Correlations among Constructs of the SIS for Adults and the SIS for Children

	HLA(C)	CNA (C)	SPA (C)	SLA (C)	HSA (C)	SA (C)	AA (C)
HLA (A)	**0.838*****	0.726***	0.711***	0.549***	0.702***	0.674***	0.671***
CLA (A)	0.727***	**0.822*****	0.771***	0.690***	0.792***	0.699***	0.749***
LLA (A)	0.775***	0.819***	0.806***	0.755***	0.818***	0.757***	0.795***
EA (A)	0.767***	0.740***	0.752***	0.698***	0.751***	0.718***	0.759***
HSA (A)	0.854***	0.830***	0.829***	0.697***	**0.844*****	0.796***	0.819***
SA (A)	0.813***	0.794***	0.822***	0.683***	0.805***	**0.812*****	0.778***
PAA (A)	0.666***	0.728***	0.747***	0.679***	0.763***	0.731***	**0.761*****

Note. Bolded values are correlations between counterpart constructs. HLA(A) = home living activities (Adults' version); CLA(A) = community living activities (Adults' version); LLA(A) = lifelong learning activities (Adults' version); EA(A) = employment activities (Adults' version); HSA(A) = health and safety activities (Adults' version); SA(A) = social activities (Adults' version); and PAA(A) = protection and advocacy activities (Adults' version). HLA(C) = home living activities (Children's version); CNA(C) = community and neighborhood activities (Children's version); SPA (C) = school participation activities (Children's version); SLA(C) = school learning activities (Children's version); HSA (C) = health and safety activities (Children's version); SA(C) = social activities (Children's version); and AA (C) = advocacy activities (Children's version).

*** $p < 0.001$.

Table 44

Gamma Weights Indicating the Impact of Intelligence and Adaptive Behavior on the Latent Constructs in the Structural Model

Latent Construct	Gamma (*SE*)	z-score	*p*-value	Standardized Gamma
The SIS for Adults				
Home living activities	- 0.434 (0.104)	-4.162	0.000	-0.398
Community living activities	-0.331 (0.099)	-3.327	0.001	-0.314
Lifelong learning activities	-0.356 (0.101)	-3.530	0.000	-0.335
Employment activities	-0.470 (0.106)	-4.455	0.000	-0.426
Health and safety activities	-0.315 (0.101)	-3.129	0.002	-0.300
Social activities	-0.432 (0.105)	-4.116	0.000	-0.396
Protection and advocacy activities	-0.276 (0.098)	-2.807	0.005	-0.266
The SIS for Children				
Home living activities	-0.563 (0.110)	-5.122	0.000	-0.491
Community and neighborhood activities	-0.537 (0.108)	-4.991	0.000	-0.473
School participation activities	-0.491 (0.105)	-4.657	0.000	-0.441
School learning activities	-0.338 (0.098)	-3.437	0.001	-0.320
Health and safety activities	-0.487 (0.105)	-4.654	0.000	-0.438
Social activities	-0.376 (0.100)	-3.776	0.000	-0.352
Advocacy activities	-0.390 (0.100)	-3.900	0.000	-0.363

Table 45

Tests of Gamma Weights Indicating the Impact of Intelligence and Adaptive Behavior on Support Needs across Two Measurements

Model	χ^2	*df*	*p*	$\Delta\chi^2$	Δ *df*	*p*	Constraint Tenable
Strong invariance model[1]	2882.949	1159	0.00	---	---	---	---
Home Living Activities	2883.856	1160	0.00	1	0.907	>.05	Yes
Community-related Activities	2886.135	1160	0.00	1	3.186	>.05	Yes
Health and Safety Activities	2885.077	1160	0.00	1	2.128	>.05	Yes
Social Activities	2883.133	1160	0.00	1	0.184	>.05	Yes
Advocacy-related Activities	2883.685	1160	0.00	1	0.736	>.05	Yes

Note. [1] Structural model with impacts of IQ and adaptive behavior (baseline model).

Discussion

Given the widespread success of the Supports Intensity Scale for Adults across the United States and various countries over the past ten years, the development of the Supports Intensity Scale for Children is encouraging in measuring children's support needs and facilitating the educational decision-making process. The purpose of this study was to systematically compare both versions of the SIS at the indicator and construct levels to identify any possible similarities and/or differences. The results of this study provide important, though certainly preliminary, information about underlying relationships between the two versions of the SIS and contribute to the development of the SIS for Children. The discussion includes three sections: (a) limitations of the study, (b) summary of the findings, and (c) implications for practice and future research.

Limitations of this Study

One of the main limitations was the heterogeneous nature of our sample. Participants' disability categories were reported based on multiple indications with no designation of a primary disability category. Only half of the total participants (n = 71) have intellectual disability without any other disabilities; the rest of the participants have multiple disabilities that include a wide range of disability categories (e.g., developmental disabilities, speech disorder, physical disability, chronic health, etc.). Study findings should be interpreted with acknowledgement of the heterogeneous nature of the sample. Future studies will be needed to include more homogeneous participants with intellectual or closely related developmental disabilities to compare the underlying relationships between the two versions of the SIS, as well as to explore potential differences in such relationships between heterogeneous and homogeneous groups.

In addition, there was a relatively small number of students who were previously classified as "profound" in areas of IQ (n = 10) and adaptive behavior (n = 9). It was necessary to combine "profound" and "severe" students into one group to run meaningful analyses. The study would have been stronger if these were large enough samples to represent unique characteristics of the two classifications in the analyses. It is also worth considering the total sample size when generalizing study findings (n =142 for each group). The current sample size was sufficient to address research questions with one exception. Power analysis indicated the possibility that the current sample size would not detect true differences in regression paths across the two scales (i.e., the last research question). Accordingly, the last study finding should be understood within this generalization-related limitation and future research is encouraged to amass a greater sample size to strengthen the generalizability of study findings.

Lastly, we did not have direct access to the assessment information (i.e., IQs and adaptive behavior scores) that is used for the diagnosis of students' intellectual disability. However, qualified teachers and psychologists who served as interviewers recruited students who receive special education services under the categorical area of intellectual disability or closely related developmental disabilities based on district identified criteria and procedures. In addition, the procedure to measure each individual's support needs using the SIS was based on at least two in-depth interviews with respondents who have known the individual with intellectual disability for a long time. In this study, more than 90 % of the first and second respondents (94% and 93% for the first and second respondents, respectively) had known the individual with intellectual disability for one to six years and had observed the person being rated in more than one environment. Although we could not verify diagnostic information regarding IQ and adaptive behavior tests, both teachers and other respondents provided the comprehensive information about the students' capacities based on day-to-day functioning. This helped to confirm the appropriateness of students' disability categories and levels of IQ and adaptive behavior.

Summary of the Findings

Item and construct comparisons. The study findings provide preliminary insight into item-level comparisons between five pairs of common constructs across the two scales. The task force developing the SIS-C identified constructs and candidate indicators in an effort to incorporate child-specific support needs and to maximize the consistency of application with the SIS-A. The highlighted indicators in Table 38 established strong invariance, suggesting that loadings and the intercepts have consistent relative relationships with each counterpart construct. This result demonstrates that these highlighted indicators appeared to have the same information across the two scales.

Some of these highlighted items in Table 38 have exactly identical activity-related descriptions (e.g., "Dressing" for both versions). However, most of the common items are stated in somewhat different descriptions that reflect the individual's chronological age and changed environmental demands, but appear to have the same underlying information (e.g., "Housekeeping and cleaning" for the SIS-A and "Completing household chores" for the SIS-C, "Engaging in loving and intimate relationships" for the SIS-A and "Maintaining positive relationships with others" for the SIS-C). It is important to note that the interpretation of the current study findings should be made with caution because it is possible that some of these identical indicators would not hold the same information when analyzed with a different sample. This could influence the overall fit indices and latent mean levels in the future analyses. For example, the counterpart indicators in the Health and Safety Activities which appeared to be the same in our sample are "Maintaining health and wellness" for the children's version and "Maintaining a nutritious diet" for the adults' version. In this example, the indicator in the children's version is broader than the one in the adults' version, which calls attention to possible alternative interpretations of study findings.

Another finding was the number of shared items per construct. Both versions of the SIS have the majority of life activities in common in areas of Home Living (six items) and Community Living (five items). Learning opportunities in these two areas tend to be easily infused into one's developmental structure more than the rest of other areas do. In addition, in these aforementioned two areas, relatively similar patterns of human performance are required for individuals to successfully function as they grow. The data suggested, however, that the support needs pertaining to advocacy-related activities have the least number of shared items (three items) among the five common counterpart constructs. This demonstrates the wide

variation at the item-level in advocacy-related activities across the two versions of the SIS, which indicates this area most reflects the developmental perspective among the five common constructs. Specifically, advocacy-related activities in the children's version primarily focus on assisting children to express their own preferences and engage in goal-governed actions and self-regulated strategies. Building upon items in the SIS-C, items in the SIS-A are expanded to assist individuals with intellectual disability to be meaningful citizens in their community (e.g., exercising legal responsibilities). Given that each common construct has different items that reflect changed expectations or demands of environments, future efforts to facilitate the successful transition among activities addressed in both versions of the SIS should be made.

In examining the latent means, only the subset of common indicators was included in latent mean comparisons because not all indicators in each construct were equivalent across the two versions of the SIS. Considering the nature of unequal counterpart indicators between two scales that reflect individuals' developmental process, comparing latent means that contain only invariant indicators would be justified to provide preliminary information. Our findings partially supported the comparability of scores between the two versions of the SIS. Although the effect sizes were small, three constructs of the five common constructs (Community Living-Related Activities, Health and Safety Activities, and Social Activities) tended to have different latent means when significant intelligence and adaptive behavior impacts were included as covariates. The heterogeneous nature of our sample may account for these differences in scores. In this study, only half of participants (n = 71) just have intellectual disability listed on the study form; the rest of the participants have additional disabilities that include blindness, hearing impairment, psychiatric disability, physical disability, chronic health issues, etc. Future research is needed to explore how the presence of multiple disability functions impact on the comparability of scores

between the two versions of the SIS, as well as to reduce the variability of disability categories. In addition, future studies need to account for the relationship between total scores across the two versions of the SIS that include both common constructs and independent constructs (i.e., lifelong learning and employment activities in the SIS-A and school participation and school learning activities in the SIS-C).

In terms of counterpart constructs' correlations, even though indicators in each pair of counterpart-constructs were not exactly the same, the data suggested that underlying correlations between a pair of counterpart-constructs were significant at the .0001 level. The correlations between counterpart constructs were strong, ranging from 0.761 to 0.844. Support needs in advocacy-related activities showed the lowest correlation (r = 0.761), indicating about 58% of shared variance between the two counterpart constructs. The lowest correlation, though still strong, is due to the variation shown at the indicator level as previously discussed. On the other hand, the construct that has the strongest correlation was health safety activities (r = 0.844), demonstrating about 71% of variance is common between the two constructs. The significant correlations, suggesting that five pairs of common activities represent similar constructs, provide another opportunity to understand the consistency between the two scales.

Two main diagnostic criteria. Both intelligence tests and adaptive behavior scales have remained key diagnostic tools to identify an individual's intellectual disability over the last 50 years (Schalock et al., 2010). The primary purpose of these two instruments is to measure personal competence for purposes of diagnosis. There is, however, a clear difference between these two competence tests; intelligence tests focus on an individual's *maximum* performance on tasks that require conceptual intelligence, whereas adaptive behavior scales measure an individual's *typical* performance in one's daily routines (Schalock et al., 2010). Established

studies identified distinct but intertwined relationships between intelligence and adaptive behavior. Although correlations vary depending on characteristics of the sample used and the types of scale used to measure individuals' intelligence and adaptive behavior, the correlations between IQ and adaptive behavior have been reported low to moderate (Destefano & Thompson, 1990; Harrison, 1987; Platt, Kamphaus, Cole, & Smith, 1991; Simeonsson & Short, 1996). Tassé and Havercamp (2006) addressed the discrepancy between IQ and adaptive scores interplays with an individual's level of motivation and the presence and severity of psychopathology, providing implications in diagnosis, classification, intervention, and support needs of individuals with intellectual and developmental disabilities.

After the introduction of the SIS-A and its wide-spread use in various entities, however, studies have reported reciprocal relationships between an individual's support needs and personal capacities. For example, Harries et al. (2005) reported that scores obtained from adaptive behavior scales (i.e., Inventory for Client and Agency Planning and Adaptive Behavior Scale) are negatively correlated with the SIS scores, indicating individuals' lower levels of adaptive behavior is strongly associated with intense support needs. Harries et al. (2005)'s finding was supported by Brown, Ouellette-Kuntz, Bielska, and Elliott (2009) that identified the negative correlations between the SIS scores and the Broad Independent W score created from the Scales of Independent Behavior-Revised (SIB-R) (Bruininks et al., 1996). However, there exists limited empirical evidence that identified causal effects of personal competence scores on individuals' support needs. This study extends the literature by providing the nature of causal relationships among aforementioned variables.

In identifying the relationships between criteria for a diagnosis of intellectual disability and a person's support needs, the data suggested that both intelligence and adaptive behavior

scores significantly predicted every support need measured by adults' and children's versions of the SIS. In this study, individuals' intelligence and adaptive behavior scores were highly correlated (r = 0.86), which means almost 74% of variance is shared between those two scores. Thus, a new latent construct that contains information regarding intelligence and adaptive behavior was created to prevent the multicollinearity and to increase the accuracy in data analyses. The combination of intelligence and adaptive behavior scores negatively predicted each support need; individuals with lower levels of intelligence and adaptive behavior, predictably, appear to require intense support needs. The degrees to which the combined intelligence and adaptive behavior scores predict the equivalent counterpart constructs measured by adults' and children's versions of the SIS were the same. This finding supports the shared underlying mechanisms among common-counterpart constructs behind these two scales.

It is important to note other elements that influence support needs in addition to personal competence. According to Thompson et al. (2004b), there are five main elements that impact individuals' support needs: (a) personal competence that includes social, practical, conceptual, and physical aspects, (b) number and complexity of life activities, (c) exceptional medical support needs, (d) exceptional behavioral support needs, and (e) number and complexity of settings. What makes critical in this conceptual structure is each element's balanced role on an individual's support needs:

> Inferring a person's pattern and intensity of support needs from traditional measures of personal competence is unlikely to result in specific and practically useful conclusions, because IQ scores and adaptive behavior measures do not provide a complete measure of personal competence, nor do they account for the other four influences on support needs. (Thompson et al., 2004b, pp. 9-10)

This view underscores the need for future research investigating further relationships between support needs and the rest of the factors. In addition, it would be worthwhile to identify any potential mediating or moderating variables on individuals' support needs so that appropriate interventions are designed and implemented to enhance human functioning of individuals with intellectual disability.

Implications for Practice and Future Research

A person's support needs, or the pattern and intensity of supports, mirror "an enduring characteristics of the person rather than simply a point-in-time description of the need for a particular type of support" (Schalock et al., 2010, p. 107). The premise behind this statement provides an important implication to professional practices, suggesting that individuals with intellectual disability need ongoing pattern and intensity of supports based on changes in individuals' capacities and/or expectations of environments as they grow. The SIS-A was the precursor in measuring individuals' support needs, which enabled educators and educational planning teams to provide appropriate supports that result in individuals' enhanced opportunities to learn various activities. In addition, the development of the SIS-C is critical because children need different patterns and intensity of supports and, importantly, assessment activities should begin as early as possible and endure throughout the individual's lives. This ties in with "the idea of prevention as a form of support," which emphasizes the role of support in minimizing the mismatch or improving individuals' overall human functioning (Schalock et al., 2010, p.128). Given discouraging study results that indicated limited participation of individuals with intellectual disability in various life activities analyzed by National Longitudinal Transitional Study-2 data (Newman et al., 2011), the seamless connection in implementing the two versions of the SIS should be emphasized so that appropriate interventions or supports are provided. A

discussion of support needs as it relates to adolescents or young adults would be incomplete without consideration of their early influences.

With regard to this, the finding of this study clearly presents messages in both research and practice. First, it is worth noting that the two scales have both similarities (i.e., the conceptual consistency in the underlying mechanisms or structures across the two scales) and differences (i.e., variations at both the indicator and construct levels and latent mean differences). However, more communalities exist. This finding assists educational planning teams to better inform and/or refine the iterative educational decision-making process prior to implementing interventions to enhance the human performance. Professionals and parents should bridge the gap between individuals' capacities and changing demands of environments by continuously focusing on universal features as well as taking advantage of different constructs and indicators that are specifically tailored to the individuals' developmental phase. In addition, constructs and equivalent indicators within each counterpart-construct as demonstrated by the partial strong invariance model in this study provide the mechanism to conduct longitudinal studies or compare support needs in different age populations.

Second, given the primary role of the SIS when planning and delivering supports, the roles and responsibilities of stakeholders should be addressed. Multiple studies have introduced the individualized supports plans (ISP) to generate and/or coordinate individualized support processes (Buntinx & Schlock, 2010). Recently, Schalock and Verdugo (2012a) provided the definition of ISP as follows: "a logical, sequential, and transparent process for developing, implementing, monitoring, and evaluating the use of best support strategies to enhance personal outcomes" (p. 80) and indicated the success of ISP relies on how well its elements are recognized by all stakeholders. To date, however, no studies examine on how the stakeholders,

including teachers and parents, understand the support planning process or use the individual support strategies aligned with one's identified support needs. Considering that the individualized educational plans—or individualized written rehabilitation plans for older populations—should incorporate ISPs to address both an individual's skill mastery and support strategies to improve learning opportunities (Schalock et al., 2010), promoting stakeholders' use of the SIS as well as their understanding of ISP is considerably important in practice.

In sum, this study provided the preliminary information pertaining to the relationship between the SIS-A and the SIS-C. By and large, the data supported that both versions of the SIS share underlying mechanisms in evaluating individuals' support needs. The study findings contribute to the development of the SIS-C by strengthening its validity and provide the basis for the future studies that compare support needs across different age groups of individuals with intellectual disability or evaluate individuals' support needs within the longitudinal study framework. In addition, in practice, promoting stakeholders' understandings and practices to identify an individual's support needs and to utilize individualized support plans should be made so as to provide individuals with adequate resources and strategies.

CHAPTER 4: CONCLUSION AND IMPLICATIONS

Considering the growing emphasis on new perspectives of disability based on the social-ecological model, it is important to measure individuals' support needs using scientifically reliable and valid instruments and to provide individualized supports to reduce and/or eliminate the gap between human capacities and the demands of environments. The results of this dissertation extend our understanding of the Supports Intensity Scale for Adults with respect to its further validity assurance, relationships between support needs and individual variables, and its one underlying support-need dimension, as well as to its use with adolescents and young adults. In addition, the results of this dissertation contribute to the development of the Supports Intensity Scale for Children by exploring similarities and differences between the two versions of the SIS.

This dissertation has two primary implications. First, efforts to further validate the existing measurements or to develop a psychometrically sound measure are critical in determining data-driven educational decisions and evaluating the impacts of interventions on diverse sub-groups of individuals with intellectual disability. In the first sub-study addressed in Chapter 2, four separate measurement invariance tests were established, suggesting that measurement properties of the SIS-A are invariant across subgroups of individuals with intellectual disability. That is, the support-need constructs measured by the SIS-A are generalizable in different contexts of samples of individuals with intellectual disability. Given the fact that a measurement's validity should be continuously examined until the multiple study findings are accumulated (Thompson et al., 2004b), the current study results provide further evidence of validity and ensure the ongoing utility for the SIS-A to measure support needs in different subgroups of individuals with intellectual disability, in this case, youth and young

adults. In the second sub-study covered in Chapter 3, the criterion validity of the SIS-C was established. The traditional description of the criterion validity addresses "the association between a new measure and an established measure of the same general construct" (Little, 2013, p. 67). Little (2013) emphasized that researchers should not focus on the narrow definitions of criterion validity, but rather open themselves to the possibilities for expected associations among the constructs. The highly correlated counterpart constructs and the identical associations between the personal-capacity construct (i.e., IQ and adaptive behavior) and support-need constructs across the adults' and children's versions of the SIS ensured the criterion validity of the SIS-C. The current study results contribute to the existing literature by demonstrating promising psychometric properties for a new instrument for measuring support needs of younger populations with intellectual disability. As such, strengthening the psychometric properties of the two versions of the SIS will enable support teams to effectively assess, plan, monitor, and evaluate individualized supports.

Second, as addressed throughout this dissertation, efforts to align an individual's identified support needs with the provision of individualized supports should be emphasized so as to reduce individuals' capacity-demand discrepancies and to improve their personal outcomes. As discussed in Chapter 2, great emphasis should be focused on a Support Needs Profile in addition to the composite support need scores when understanding each individual's support needs. Importantly, the current data supports that the Protection and Advocacy supplementary subscale also consists of the higher-order support-need construct; therefore, it should not be left out when designing and implementing individualized support strategies. In addition, the support needs measured by the SIS-A appear to be influenced by individual variables that include age, gender, and the levels of exceptional support needs; thus, practitioners and parents should

understand these aspects when employing a system of supports. In Chapter 3, study findings further reinforce the importance of individualized supports that are aligned with each person's support needs. One of the important aspects in identifying support needs stems from its iterative nature; support plans should be revised as people with intellectual disability grow or encounter new life events. The fact that the two versions of the SIS appear to have identical underlying mechanisms, though differences inevitably exist to reflect an individual's chronological age at the indicator and construct levels, assists educational planning teams to inform or refine the educational decision-making process across an individual's lifespan. However, educational planning teams should consider that the information the SIS provides is only a "piece of the puzzle" (Thompson et al., 2004b, p. 89). Other information such as an individual's IQ, adaptive behavior, preferences, and interests should also be addressed to provide the comprehensive supports that incorporate the person-environment fit model of disability. It is also imperative to develop effective instructional strategies and interventions to reduce or eliminate an individual's support needs, and future studies should examine the effects of such interventions.

In closing, this dissertation provides important implications to the field by proving the psychometric properties of the two versions of the SIS, examining variables that influence an individual's support needs, and suggesting ways to link identified support needs and individualized systems of supports. Moving beyond addressing the systems of supports at the individual level, broader efforts to establish systems of supports at family, organization, and society levels should be made (Schalock & Verdugo, 2012b; Shogren, 2013; Shogren & Turnbull, 2010). This dissertation serves as an essential prerequisite for such efforts to assist individuals with intellectual disability to achieve equal opportunities, full participation, independent living, and economic self-sufficiency.

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APPENDICES

Appendix A: History of Three Criteria in Defining Intellectual Disability

Year and Author	Definition	IQ Cutoff	Diagnosis	Develop-mental Period	Adaptive Behavior	Levels of Severity by IQ
5th AAMR Definition: Herber, 1959	Mental retardation refers to subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in one or more of the following: (1) maturation, (2) learning, (3) social adjustment	Less than one standard deviation *(SD)* below the population mean of the age group involved on measures of general intellectual functioning	Both required: standardized IQ measures and measure of impairment in one or more aspects of adaptive behavior (e.g., Vineland Social Maturity Scale)	Birth through approximately 16 years	Refers to the effectiveness with which the individual copes with the natural and social demands of the environment. It has two major facets: (a) the degree to which the individual is able to function and maintains him or herself independently, and (b) the degree to which he or she meets satisfactorily the culturally imposed demands of personal and social responsibility	Level V = -1 to -2 *SD* Level IV = -2 to -3 *SD* Level III= -3 to -4 *SD* Level II= -4 to -5 *SD* Level I= < -5 *SD*
6th AAMR Definition: Herber, 1961	Mental retardation refers to subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior	Greater than one *SD* below *M* (theoretically 16% of the population)	Standardized IQ and adaptive behavior tests	Birth through age 16	Effectiveness of the individual to adapt to the natural and social demands of his or her environment as reflected in maturation, learning, and social adjustment	Borderline MR: -1 SD; and mild, moderate, severe, profound
7th AAMR Definition: Grossman, 1973	Mental retardation refers to significantly subaverage general intellectual functioning *existing concurrently with* deficits in adaptive behavior, and manifested during the developmental period	Two or more *SD*s below *M* (theoretically 3% of the population)	Standardized IQ and adaptive behavior tests	Upper age limit of 18 years	Effectiveness of degree with which the individual meets the standards of personal independence and social responsibility expected of his or her age and cultural group. May be reflected in the following areas: (a) early years: sensorimotor skills, communication, self-help, socialization; (b) childhood and early adolescence: application of basic academics in daily life, application of reasoning and judgment; (c) later adolescence and adult life: vocational and social responsibilities and performances	Mild, moderate, severe, and profound. Borderline intelligence defined as falling between retardation and average intelligence ("slow learners")

Year and Author	Definition	IQ Cutoff	Diagnosis	Develop-mental Period	Adaptive Behavior	Levels of Severity by IQ
8th AAMR Definition: Grossman, 1983	Mental retardation refers to significantly subaverage general intellectual functioning resulting in or associating with concurrent impairments in adaptive behavior and manifested during the developmental period	IQ of 70 or below on standardized measures of intelligence; upper limit is intended as a guideline and could be extended to 75 or more	Standardized IQ and adaptive behavior tests	Period of time between conception and the 18th birthday	Significant limitations in an individual's effectiveness in meeting the standards of maturation, learning, personal independence, or social responsibility that are expected for his or her age level and cultural group	Mild, moderate, severe, and profound
9th AAMR Definition: Luckasson et al., 1992	Mental retardation refers to substantial limitations in present functioning. It is characterized by significantly subaverage intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skills areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work. Mental retardation manifests before age 18.	IQ standard score of approximately 70 to 75 or below based on assessment that includes one or more individually administered general intelligence tests	Standardized IQ tests and tests of adaptive behavior skills; coupled with team member observations and clinical judgment; use of valid assessment measures and process	Period of time between conception and the 18th birthday	Adaptive skills refers to an array of competencies that reflect both the ability to fit into a given niche as well as the ability to change one's behavior to suit the demands of a situation. The adaptive skill areas were specified with the requirement that an individual evidence sufficiently comprehensive limitations, interpreted as being limitation in 2 or more skills areas applicable to his or her age. The 10 areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work	Omitted, as classified by IQ scores. Intensities of supports needed by an individual in adaptive skills areas were added. Intensities change across time and by adaptive skills area for given individuals, thus not a substituted for the IQ levels classification

(table continues)

Year and Author	Definition	IQ Cutoff	Diagnosis	Develop-mental Period	Adaptive Behavior	Levels of Severity by IQ
10th AAMR Definition: Luckasson et al., 2002	Mental retardation is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.	Performance that is at least two *SD*s below the *M* of an appropriate assessment instrument, considering the standard error of measurement for the specific assessment instruments used and the instruments' strengths and limitations	Standardized IQ tests and tests of adaptive behavior skills; coupled with team member observations and clinical judgment; use of valid assessment measures and process	Period of time between conception and the 18th birthday	Adaptive behavior is the collection of conceptual, social, and practical skills that have been learned by people in order to function in their everyday lives. […] Significant limitations in adaptive behavior can be established only through the use of standardized measures normed on the general population including people with disabilities and people without disabilities, and are defined as performance that is at least two *SD*s below the *M* of (a) one of the flowing three types of adaptive behavior: conceptual, social, or practical, or (b) an overall score on a standardized measure of conceptual, social, and practical skills	Depending on the purposes of applying the definition (diagnosis, classification, or planning supports), an individual who is found eligible for mental retardation services may be classified in various ways: by support intensity, IQ range, adaptive behavior limitations, etiology, mental health categories, etc.
11th AAIDD Definition: Schalock et al., 2010	Intellectual disability is characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.	An IQ score that is approximately two *SD* below the *M*, considering the standard error of measurement for the specific assessment instruments used and the instruments' strengths and limitations	Diagnosed using assessment information obtained from standardized and individually administered instruments that assess intellectual functioning and adaptive behavior; coupled with clinical judgment and use of valid assessment measures and process	Period of time between conception and the 18th birthday	Performance on a standardized measure of adaptive behavior that is normed on the general population including people with and without ID that is approximately two *SD* below the *M* of either (a) one of the following three types of adaptive behavior: conceptual, social, and practical or (b) an overall score on a standardized measure of conceptual, social, and practical skills	Depending on the purposes (diagnosis, classification, or planning supports), an individual who is found eligible for ID services may be classified in various ways: by support intensity, IQ range, adaptive behavior limitations, etiology, mental health categories, etc.

Note. Adapted from Mental Retardation: Definition, classification, and systems of supports (10th ed., pp. 21-23) by Luckasson et al. (2002), Washington, DC: American Association on Mental Retardation and Intellectual Disability: Definition, classification, and systems of supports (11th ed) by Schalock et al. (2010), Washington, DC: American Association on Intellectual and Developmental Disabilities.

Appendix B: Item Descriptions for the SIS for Adults

Part A: Home Living Activities

Home Living Activities Items	What support does the individual need to? (Initial Description) • Includes supports to (Expanded Description):
1. Using the toilet	Use the bathroom throughout the day? • Access the bathroom • Accomplish steps before and after toileting in a socially acceptable manner • Move out of the bathroom and back to a previous activity • Use other voiding alternatives • Preserve dignity and privacy associated with toileting
2. Taking care of clothes (includes laundering)	Maintain clothing—includes laundering, ironing, sewing, minor repairs, hanging clothes in closets and/or folding/placing clothes in chest of drawers? • Do all steps to clean clothes • Fold and put clothing away in dressers, closets, and so on, or hang clothes in closet • Take clothes to a dry cleaner • Iron, sew, and make minor repairs
3. Preparing food	Cook meals, including breakfast, lunch, dinner, and snacks? • Prepare and/or cook desired meals within his/her budget • Menu/meal planning • Prepare, wash, cut, chop, blend, and/or mix food • Use kitchen appliances to prepare food • Prepare foods for specialized eating arrangements where relevant
4. Eating food	Ingest food through the mouth, chewing, swallowing? • Set up the food for ingestion • Assist with or teach use of utensils, including appropriate use of a knife, fork, and spoon or adaptive utensils • Cut food on plate to appropriate size • Assist with positioning to facilitate chewing, swallowing, and digestion • Assist during tube feeding • Regulate food intake
5. Housekeeping and cleaning	Maintain a clean and presentable living area, including sweeping, mopping, dusting? • Maintain a clean and presentable living area, including sweeping, mopping, dusting, vacuuming, making bed, and changing sheets • Straighten things up in all living areas, put items away • Clean bathroom

	• Put trash in trash can; take out trash; throw out spoiled food; clear and clean after meals; wash/dry dishes or properly use dishwasher; and clean appliances, such as microwave, stove, toaster, blender, and so on • Properly use cleaning supplies
6. Dressing	Get dressed for the day, and change clothes during the day when necessary? • Select clothes appropriate for the day's changing activities • Put on and take off clothes, including zippers, snaps, buckles, buttons, laces, bras, and belts • Identify and/or assist when clothing needs to be changed due to being soiled, dirty, or inappropriate • Choose weather- and age-appropriate clothing for the occasion
7. Bathing and taking care of personal hygiene and grooming needs	Keeping clean and properly groomed—includes activities such as taking a shower or bath, shaving, caring for menstrual needs, and so on? • Recognize the need to address personal hygiene and identify when bathing and grooming is needed • Safely get in and out of tub or shower; make appropriate water adjustment • Thoroughly clean the body in either a shower or bath • Brush teeth, shave, wash and brush hair, wash hands, have haircuts, maintain nail/skin care, and so on • Assist with menstrual care • Keep clean throughout the day • Change clothing protectors
8. Operating home appliances	Operate common home devices used on a regular basis such as the television, microwave oven, toaster, coffee maker, etc.? This does not refer to more advanced features or devices such as programming a VCR to record programs. • Use items such as the television, telephone, VCR/DVD, radio, air conditioners, heaters, fans, stereo, telephone, and so on

Part B: Community Living Activities

Community Living Activities Items	**What support does the individual need to? (Initial Description)** • **Includes supports to (Expanded Description):**
1. Getting from place to place throughout the community (transportation)	Get to and from places in the community such as grocery store, banks, shopping centers, etc.? Don't confuse this item with determining how much support a person needs to operate a motor vehicle; e.g., a passenger who needed to be driven to different localities, but who was a cooperative car rider, would probably need only "verbal prompting" whether it was a support-staff person driving a car or a bus driver operating a city bus. For this item, "full physical assistance" would apply to those individuals who needed physical assistance to enter or exit a vehicle or required someone to physically make sure he or she remained in a seat. • Get to and from places in the community, including essential places as well as recreational places • Use some mode of transport • Know routes to and from desired destination • Get in and out of a vehicle safely
2. Participating in recreation/leisure activities in the community	Take part in recreation/leisure activities in community settings such as bowling on a team, participating in an aerobics class, or going to a movie? • Take part in recreation/leisure activities in community settings • Know what to do at the activity
3. Using public services in the community	Complete tasks involved in typical errands such as banking and accessing community services (e.g., a health-care clinic for flu shots)? • Identify/convey the need for services • Use post office, library, bank, food and clothing banks, shelters • Meet with relevant public-service providers and government agencies in the community • Complete tasks to use needed services, including Medicaid, food stamps, social security, identification cards, driver's license, and utilities bills
4. Going to visit friends and family	Access and interact with other individuals whom he or she considers close friends or family (not including paid staff)? • Get the individual to places where he/she has an opportunity to interact with others who are considered close friends or family members • Use local transportation • Arrange or plan visits, including the support needed for the visit and supports needed during the visit • Interact appropriately with friends and family

5. Participating in preferred community activities (church, volunteer, etc.)	Take part in activities that the individual truly values, such as participating in a church function or volunteering for a community organization? • Take part in activities that the individual truly values
6. Shopping and purchasing goods and services	Go to a grocery store or shopping center, selecting items for purchase, and making a purchase? • Identify items to purchase • Select appropriate items • Pay for items, count change, write checks, get refunds • Interview to purchase a service • Purchase through catalogs and/or shop for a specific item on the internet
7. Interacting with community members	Interact with community members such as neighbors, store clerks, police officers, and others in a socially appropriate manner? • Interact with community members in a socially acceptable manner • Communicate effectively in a variety of settings • Use social conventions such as shaking hands and saying please and thank you • Maintain socially appropriate boundaries • Know when to initiate conversations and with whom • Be understood
8. Accessing public buildings and settings	Use public settings such as parks, post offices, and stores? • Physically enter public buildings and settings • Follow rules for entering, existing, and using the facility • Understand the consequences if rules are not followed • Use elevators, escalators, steps, and doors

Part C: Lifelong Learning Activities

Lifelong Learning Activities Items	What support does the individual need to? (Initial Description) • Includes supports to (Expanded Description):
1. Interacting with others in learning activities	Participate in educational settings with fellow students and instructors? • Interact in formal educational settings with fellow students and instructors • Express oneself • Understand others • Follow instructions • Communicate need for assistance • Get along with others in a structured learning environment
2. Participating in training/educational decisions	Express choices and participate in the planning process regarding the pursuit of training and educational goals? • Understand and express choices concerning learning options and goals • Locate courses, classes, or workshops offered through formal venues include • Participate in the planning process of an educational pursuit/goal • Register for the course • Develop a course schedule
3. Learning and using problem-solving strategies	Apply problem-solving strategies to real-life situations (e.g., learning what to do when you miss the bus to assure personal safety as well as to permit you to eventually reach your destination)? • Identify when something goes wrong or there is a problem • Identify strategies to solve problems • Learn how to solve problems in situations, such as, but not limited to, what to do when you miss a bus or an appointment; what to do to safely travel across town; what to do when you lock yourself out of your home; how to report problems at work or home; or rescheduling missed appointments • Apply learned strategies to real-life situations
4. Using technology for learning	Operate computers or other technology that a person needs to participate in instructional programs? • Operate computers or other technology that that person needs to participate in instructional programs • Use computers; calculators; augmentative communication devices; note taking devices, such as voice recorder; TDDs and TTYs; and devices needed to view educational materials
5. Accessing training/educational settings	Complete tasks involved in accessing adult educational opportunities (e.g., registering for classes; getting to and from school)? • Locate courses or workshops offered through a variety of community providers

	• Obtain resources for paying tuition for classes • Obtain transportation and/or get to and from the training/educational setting • Locate the specific room where the course will be held
6. Learning functional academics (reading signs, counting change, etc.)	Apply functional academics to real-life situations (e.g., learning how to time with a digital watch and using the watch to keep to a daily schedule, count money for purchase)? • Learn to read and write • Learn to add and subtract • Apply reading and writing skills • Apply math skills • Learn to tell time, keep a schedule, count money for purchases, read bus schedules, identify day of the week and date on a calendar, find telephone numbers, and so on
7. Learning health and physical education skills	Apply health and physical-education skills to real-life situations (e.g., learning breast self-examination skills and identifying when a professional health-care worker should be consulted)? • Learn when/why to make medical and dental appointments • Learn to apply medications and special treatments; report side effects • Learn to recognize and report health-care needs • Learn to follow and maintain proper diet and exercise • Learn about good nutrition and understand the effects of poor nutrition • Learn personal safety skills • Apply learning to understand the benefits of healthy lifestyle routines
8. Learning self-determination skills	Apply self-determination skills to real-life situations (e.g., identifying a personal goal and making a plan to achieve the goal)? • Learn to identify and express personal goals and individual preferences • Learn consequences and responsibilities associated with choices and decisions • Learn to self-direct daily living activities • Learn individual rights • Apply skills to make plans and decisions to achieve personal goals • Apply skills to direct personal supports • Speak up for oneself
9. Learning self-management strategies	Apply self-management strategies to real-life situations (e.g., rewarding oneself with a snack after completing a major task)? • Learn to reward oneself for achieving a goal or completing a task • Learn and use strategies to manage and resolve conflict • Learn and use strategies to maintain routines that are desired

	and effective at home and in the community, including time management strategies • Learn and use strategies to spend money within one's budget • Learn impulse control, anger management, and self-restraint • Learn to follow through with commitments, be trustworthy and truthful • Learn to adapt to changing situations • Learn and use self-management strategies for self-control/restraint
Part D: Employment ActivitiesEmployment Activities Items	**What support does the individual need to? (Initial Description)** • **Includes supports to (Expanded Description):**
1. Accessing/receiving job/task accommodations	Identify and arrange reasonable accommodations on a job? • Identify, communicate, develop, obtain, and implement job accommodations • Advocate for accommodations and problem solve regarding accommodations, and garner resources for the implementation of the accommodation
2. Learning and using specific job skills	Develop specific job skills and apply these skills on his or her job? • Learn the job and achieve all aspects of acceptable job performance, not just skills for manipulation tasks • Communicate the need for help to complete a task • Follow company rules and policies
3. Interacting with co-workers	Communicate with co-workers regarding work-related matters and informally socialize with co-workers? • Communicate with coworkers regarding work-related matters and informally socialize with coworkers • Understand the appropriate amount of time to socialize during work • Understand rules regarding socializing and breaks • Avoid arguments or disputes with coworkers, using polite language and so on • Request assistance/information from coworkers • Be understood by coworkers
4. Interacting with supervisors/coaches	Communicate with supervisors and job coaches regarding work-related matters and informally socialize with supervisors and job coaches? • Communicate with supervisors and job coaches regarding work-related matters, and informally socialize with supervisors and job coaches • Communicate problems • Ask for training/information when needed • Request assistance from supervisors • Avoid arguments or disputes with supervisors, using polite language and so on

	• Be understood by supervisors
5. Completing work-related tasks with acceptable speed	Perform work at pace that is consistent with the productivity of other workers with the same job? • Work at the same level of productivity as that of a typical worker throughout the day • Minimize and/or avoid distractions • Maintain focus/attention on work tasks • Reduce frustration, disinterest, anxiety, and/or agitation with work tasks
6. Completing work-related tasks with acceptable quality	Perform work at a level of quality that is consistent with the performance of other workers with the same job? • Perform work at a level of quality that is consistent with the performance of other workers with the same job • Discriminate what an acceptable standard of quality work is • Recognize and correct mistakes
7. Changing job assignments	Incorporate different assignments into a job to meet the changing needs of the employer or adjust to a new job assignment/task? • Adjust to changing job assignment or task, both new and known • Take on and transition to new assignments or routines that may be more difficult and challenging, and respond/adapt to such situations • Respond/adapt to unexpected changes at work
8. Seeking information and assistance form an employer	Contact and get information from an employer regarding the status of one's benefits (e.g., vacation days accrued) or the availability of employee assistance programs? • Acquire information from employer regarding the benefits of the company • Acquire information from employer about company policies and procedures • Identify the process and need for accessing desired information • Identify the appropriate department/person for securing information • Complete the necessary forms and steps

Part E: Health and Safety Activities

Health and Safety Activities Items	What support does the individual need to? (Initial Description) • **Includes supports to (Expanded Description):**
1. Taking medications	Take medicine at the correct time and prescribed levels? • Understand the purpose, desired effects, and potential side effects of all medications that a person takes/applies/injects • Report side effects to caregiver or physician • Recognize labels • Take/apply/inject medications at prescribed levels and times, or as recommended • Fill a pillbox, refill medications/prescriptions, and so on • Prepare medications for ingestion/injection/application
2. Avoiding health and safety hazards	Avoid everyday health and safety hazards such as walking out in front of a car, accidentally poisoning self, practicing safe sex, etc.? • Recognize dangerous situation and personal vulnerability at home and in the community • Utilize things designed to promote safety • Be aware of and follow safety procedures for storing chemicals, poisons, and so on to avoid potentially harmful situations • Use safe practices at home and in the community • Recognize personal vulnerability
3. Obtaining health-care services	Obtain help when getting ill such as communicating with health-care professionals, making an appointment to see a physician, getting a prescription filled from a pharmacist, etc.? • Recognize and communicate health care needs with caregivers and medical personnel • Make medical appointments with doctors, specialists, dentists, and/or therapists • Participate in an office visit • Get prescriptions filled as needed • Obtain medical services • Have appropriate medical and insurance cards • Coordinate health-care services
4. Ambulating and moving about	Physically move self around the environment? • Make transfers • Move from one place to another • Put on prosthesis relevant to mobility • Negotiate even and uneven terrain, steps, curbs, and so on
5. Learning how to access emergency services	Apply emergency skills to real-life situations (e.g., dialing 911, requesting the right types of assistance, informing dispatcher of key information such as address and type of crisis)? • Learn to and when to request the right type of assistance, contact 911, provide key information to dispatcher, such as

	address, type of crisis, and so on • Learn and use a personal emergency response system when needed • Plan and develop an emergency preparedness plan • Plan and practice prescribed responses or drills to prepare for emergencies
6. Maintaining a nutritious diet	Eat a sufficiently nutritious diet to avoid medical problems associated with poor nutrition? • Practice good nutrition and understand the effects of poor nutrition • Make healthy choices in selecting foods to eat • Plan healthy and nutritious meals
7. Maintaining physical health and fitness	Exercise sufficiently to avoid medical problems associated with poor physical health or fitness or obesity? • Select and plan activities for physical health and fitness • Engage in physical fitness activities on a routine basis to avoid medical problems associated with poor physical health, fitness, and/or obesity • Locate a gym or activity, and access facilities or locations for maintaining fitness
8. Maintaining emotional well-being	Maintain a lifestyle conducive to avoiding serious mental health problems such as depression, using relaxation techniques to manage anxiety, use coping strategies to control anger, access appropriate clinical therapy services? • Maintain a lifestyle conducive to avoiding serious mental health problems, such as depression or panic attacks • Use relaxation techniques, appropriate coping strategies to self-management behavior • Build confidence and self-esteem • Access mental health resources or clinical therapy services if needed • Participate in therapeutic homework and positive-behavior support plans • Plan a structured day as related to maintaining mental well-being

Part F: Social Activities

Social Activities Items	What support does the individual need to? (Initial Description) • **Includes supports to (Expanded Description):**
1. Socializing within the household	Socially interact with others (e.g., roommates, family members) in a household? • Facilitate/promote verbal or nonverbal social interaction that is meaningful to the person and understood by others in the home • Know when to socialize • Share interests or information in a cooperative way in the home • Discuss important issues • Set up and use augmentative communication to interact with others • Demonstrate respect for privacy and boundaries
2. Participating in recreation/ leisure activities with others	Take part in recreation/leisure activities with others such as participating on a sports team, playing card or table games, or hosting a holiday party? • Participate in recreation/leisure activities with others • Engage in social interactions during recreation and leisure activities • Cooperate and interact with others during recreation/leisure activities • Use assistive devices/technology to interact if relevant
3. Socializing outside the household	Socially interact with others (e.g., neighbors, friends, co-workers) outside of the household? • Communicate effectively and facilitate/promote verbal or nonverbal social interaction that is meaningful to the person and understood by others • Be understood • Set up and use augmentative communication devices if relevant • Maintain a conversation or discussion • Expressing oneself respectfully
4. Making and keeping friends	Initiate and maintain friendships? • Learn social and other skills related to friendships • Locate programs/activities where friendships may become possibilities • Communicate with peers and arrange opportunities to get together with others • Accept invitations to participate in activities with friends • Use the phone and other communications to maintain friendships

5. Using appropriate social skills	Inform others about personal problems or desires? • Inform others about personal desires and/or problems using verbal, nonverbal, and/or assistive technologies to communicate with others • Identify that a need/problem exists • Recognize the importance of communicating about a need/problem • Inform the appropriate individual what the need/problem is • Use effective strategies to talk about needs • Personal items can include private or embarrassing issues, discreet needs, important requests, hygiene products, and so on.
6. Using appropriate social skills	Demonstrate social skills such as good manners, initiation of social greetings and partings, maintaining personal space, etc.? • Learn and use social skills when interacting with others • Recognize how others feel and express emotion that fits the situation • Learn and be able to use expected behaviors and social exchanges in different situations • Learn and use socially acceptable tale manners
7. Engaging in loving and intimate relationships	Initiate and maintain a special, intimate/romantic relationship? • Plan dates and activities to promote healthy relationships that may lead to intimacy • Learn activities that are related to intimate relationships, such as dating skills, understanding personal boundaries, and respect for partner • Learn and understand concept of what "consent" means • Express feelings for partner fittingly • Maintain intimate relationships, including but not limited to sexual interactions
8. Engaging in volunteer work	Take part in volunteer projects such as participating with others on an organized project (e.g., clean the park day, working in hospital, shelter), contacting a community group seeking volunteers and learning how to apply one's own skills to the effort, etc.? • Identify causes and issues of interest • Learn how to apply personal skills to the volunteer effort • Participate in organized activities as a volunteer • Contact community groups seeking volunteers

Supplemental Protection and Advocacy Scale

Protection and Advocacy Activities Items	**What support does the individual need to? (Initial Description)** • **Includes supports to (Expanded Description):**
1. Advocating for self	Express personal preferences, including wants and needs, and provide justification for requests? • Advocate in all aspects of life, including speaking up for oneself to exercise control over one's life • Learn to advocate in a respectful manner • Recognize and understand choices and decisions related to responsibilities and consequences, whether good or bad • Express personal preferences, needs, and wants • Explaining why things are important in various settings and situations
2. Managing money and personal finances	Budget money, maintain banking accounts (e.g., checking and savings), and pay bills? • Provide protections that an individual may need in place to assure responsible management of money • Reduce possibility of exploitation • Learn and apply positive decision-making and protection strategies
3. Protecting self from exploitation	Identify when an exploiter is attempting to take an unfair advantage (i.e., to promote his or her own interests at the expense of one's own interests), and then take action to prohibit the exploiter from gaining this advantage? • Learn and practice skills relevant to recognizing and avoiding exploitation • Plan for protection against exploitation
4. Interacting with supervisors/coaches	Abide by the laws of the community and exercise civic responsibilities (e.g., vote in elections)? • Understand and exercise civic responsibilities and rights as a community member/citizen • Understand and comply with basic laws
5. Completing work-related tasks with acceptable speed	Participate in the activities of self-advocacy and support organizations such as People First? • Participate in self-advocacy organizations • Serve on advisory boards and committees • Identify with support groups for a particular life situation, such as grief and recovery, substance abuse, victims of violence, and so on • Take an active membership role, including assuming responsibilities

6. Completing work-related tasks with acceptable quality	Contact an attorney for legal advice and employ an attorney for legal services? • Identify when legal assistance is needed • Access/employ legal assistance • Attend and participate in initial visits with attorney to explain issues/concerns
7. Changing job assignments	Act on personal choices and follow through on personal decisions? • Understand that choices and decisions are related to consequences and responsibilities • Identify people or things that influence choices and/or decisions • Assess opportunities to make choices and decisions based on multiple options • Differentiate between the types and level of importance of choices and decisions • Make informed decisions; understand and be responsible for the consequences of various decisions
8. Seeking information and assistance form an employer	Help or assist others advocate? • Identify opportunities and situations where advocacy of another person is warranted • Get involved in self-advocacy organizations, civic activities, and walk-a-thons in an effort to advocate for others • Assist others in speaking out when they cannot speak out for themselves or express personal preferences • Know when and how to help others • Teach others ways to speak up for their beliefs, needs, wants, and so on

Exceptional Medical Support Needs

Item	Expanded Description
Respiratory care	
Inhalation or oxygen therapy	Uses nebulizer, oxygen, and/or C-PAP
Postural drainage	Needs positioning to help drain secretions/mucus in the lungs
Chest PT	Needs chest physical therapy to help with drainage of secretions
Suctioning	Needs suctioning of secretions
Feeding assistance	
Oral stimulation or jaw positioning	Needs physical assistance or oral stimulation to help with nourishment
Tube feeding (e.g., nasogastric)	Uses a nasogastric or gastrostomy tube for nourishment
Parenteral feeding (e.g., IV)	Uses an intravenous tube for feeding
Skin care	
Turning or positioning	Needs assistance with repositioning or turning in chair or bed to prevent sores
Dressing of open wound(s)	Needs assistance with the cleaning and dressing wounds of chronic open sores
Other exceptional medical care	
Protection from infectious diseases due to immune system impairment	Requires universal precautions to prevent infections due to weakened immunity system
Seizure management	Needs medication and seizure precautions and management
Dialysis	Uses peritoneal dialysis or hemodialysis
Ostomy care	Needs colostomy care
Lifting and/or transferring	Needs assistance for lifting and/or transferring person to and from chair, bed, so on
Therapy services	Needs assistance in implementing recommendations given regarding physical therapy, occupational therapy, speech-language therapy, or individual or group psychological therapies
Other(s)—Specify:	Should include a listing of any exceptional medical needs that are not accounted for in the previous items. List, rate, and specify each support separately.

Item	Description
Externally directed destructiveness	
Prevention of assaults or injuries to others	Hits, punches, kicks, bites, or intentionally harms others
Prevention of property destruction	Defaces property, breaks windows, damages furniture, sets fire, and so on
Prevention of stealing	Steals or takes others' property or shoplifts, and so on, either deliberately or otherwise
Self-directed destructiveness	
Prevention of self-injury	Engages in self-injurious behavior, such as head banging, eye gouging, skin picking, cutting, and so on
Prevention of pica (ingestion of inedible substances)	Eats inedible substances, such as cigarette butts, paper, or other objects
Prevention of suicide attempts	Attempts to hurt oneself with the intention of suicide
Sexual	
Prevention of sexual aggression	Engages in sexually aggressive behavior, including pedophilia, sexual assaults, and so on
Prevention of nonaggressive but inappropriate behavior	Engages in inappropriate behavior, such as masturbates in public places, exhibitionism, stalking, and so on
Other	
Prevention of tantrums or emotional outbursts	Screams, curses, throws objects, threatens physical violence or verbally demeans others, and cries excessively
Prevention of wandering	Runs away and wanders off with the risk of getting lost or injured
Prevention of substance abuse	Engages in excessive consumption of alcohol, misuses prescription medication, uses illegal drugs or other toxic substances, such as sniffing glue, paint, and so on
Maintenance of mental health treatments	Takes psychotropic medication and complies with prescribed mental health treatments
Prevention of other serious behavior problem(s)—Specify:	Should include a listing of any exceptional behavioral concerns that are not accounted for in the previous items. List, rate, and specify each support separately.

Note. Adapted from Supports Intensity Scale: *Users Manual* by Thompson et al. (2004b), Washington, DC: American Association on Mental Retardation.

Appendix C: Means, Standard Deviations, and Correlations among the Parcels for Each Group

C-1: The Higher Medical Support-Need Group

	PA1	PA2	PA3	PB1	PB2	PB3	PC1	PC2	PC3	PD1	PD2	PD3	PE1	PE2	PF1	PF2	PF3	PG1	PG2	PG3
M	0.707	0.655	0.622	0.650	0.683	0.585	0.665	0.685	0.717	0.689	0.657	0.746	0.613	0.691	0.593	0.616	0.623	0.626	0.576	0.669
SD	0.148	0.164	0.182	0.134	0.104	0.133	0.153	0.146	0.141	0.193	0.166	0.198	0.150	0.132	0.179	0.174	0.210	0.132	0.131	0.191
PA1	1																			
PA2	0.816	1																		
PA3	0.786	0.814	1																	
PB1	0.629	0.58	0.535	1																
PB2	0.610	0.56	0.526	0.775	1															
PB3	0.631	0.601	0.58	0.713	0.696	1														
PC1	0.577	0.519	0.482	0.651	0.563	0.572	1													
PC2	0.491	0.461	0.421	0.565	0.515	0.510	0.767	1												
PC3	0.471	0.429	0.385	0.578	0.518	0.501	0.750	0.831	1											
PD1	0.444	0.398	0.357	0.515	0.444	0.454	0.612	0.603	0.607	1										
PD2	0.444	0.389	0.358	0.502	0.438	0.459	0.620	0.587	0.584	0.886	1									
PD3	0.443	0.409	0.376	0.434	0.394	0.387	0.547	0.558	0.561	0.794	0.820	1								
PE1	0.698	0.711	0.675	0.612	0.552	0.598	0.645	0.645	0.647	0.530	0.500	0.519	1							
PE2	0.660	0.644	0.607	0.652	0.593	0.628	0.652	0.633	0.642	0.566	0.537	0.508	0.785	1						
PF1	0.544	0.492	0.465	0.646	0.545	0.552	0.661	0.567	0.589	0.576	0.558	0.489	0.637	0.648	1					
PF2	0.530	0.478	0.435	0.662	0.559	0.547	0.685	0.607	0.646	0.613	0.578	0.525	0.645	0.642	0.769	1				
PF3	0.574	0.527	0.491	0.616	0.490	0.540	0.680	0.598	0.629	0.593	0.561	0.478	0.676	0.677	0.773	0.750	1			
PG1	0.443	0.399	0.357	0.557	0.503	0.498	0.627	0.637	0.661	0.612	0.583	0.525	0.599	0.625	0.621	0.685	0.651	1		
PG2	0.432	0.387	0.34	0.55	0.486	0.480	0.592	0.604	0.627	0.591	0.559	0.483	0.579	0.607	0.630	0.681	0.660	0.784	1	
PG3	0.423	0.39	0.344	0.52	0.449	0.445	0.603	0.656	0.693	0.598	0.543	0.527	0.609	0.634	0.578	0.649	0.630	0.743	0.710	1

C-2: The Lower Medical Support-Need Group

	PA1	PA2	PA3	PB1	PB2	PB3	PC1	PC2	PC3	PD1	PD2	PD3	PE1	PE2	PF1	PF2	PF3	PG1	PG2	PG3
M	0.518	0.452	0.399	0.523	0.576	0.447	0.560	0.601	0.640	0.576	0.570	0.641	0.446	0.546	0.458	0.500	0.463	0.555	0.504	0.568
SD	0.219	0.207	0.220	0.195	0.163	0.176	0.182	0.166	0.164	0.222	0.170	0.238	0.167	0.182	0.215	0.207	0.239	0.147	0.143	0.223
PA1	1																			
PA2	0.831	1																		
PA3	0.817	0.815	1																	
PB1	0.713	0.693	0.662	1																
PB2	0.706	0.686	0.648	0.856	1															
PB3	0.723	0.702	0.683	0.776	0.764	1														
PC1	0.686	0.650	0.604	0.718	0.661	0.682	1													
PC2	0.619	0.591	0.553	0.672	0.665	0.658	0.762	1												
PC3	0.607	0.579	0.536	0.692	0.688	0.639	0.749	0.810	1											
PD1	0.640	0.602	0.583	0.692	0.651	0.667	0.715	0.652	0.653	1										
PD2	0.633	0.594	0.569	0.676	0.635	0.657	0.723	0.658	0.652	0.866	1									
PD3	0.613	0.567	0.548	0.609	0.584	0.576	0.648	0.610	0.613	0.775	0.78	1								
PE1	0.752	0.739	0.701	0.716	0.682	0.711	0.740	0.728	0.737	0.691	0.676	0.646	1							
PE2	0.721	0.698	0.671	0.757	0.739	0.738	0.728	0.729	0.735	0.727	0.699	0.656	0.814	1						
PF1	0.688	0.643	0.628	0.740	0.672	0.689	0.717	0.634	0.654	0.726	0.697	0.637	0.749	0.741	1					
PF2	0.675	0.635	0.605	0.746	0.675	0.674	0.731	0.667	0.688	0.719	0.694	0.634	0.755	0.752	0.833	1				
PF3	0.698	0.658	0.651	0.711	0.633	0.677	0.703	0.639	0.659	0.713	0.676	0.607	0.754	0.745	0.824	0.798	1			
PG1	0.575	0.556	0.526	0.676	0.647	0.645	0.704	0.708	0.721	0.690	0.685	0.602	0.709	0.736	0.686	0.725	0.680	1		
PG2	0.582	0.553	0.532	0.663	0.629	0.632	0.664	0.672	0.683	0.681	0.660	0.594	0.699	0.732	0.695	0.722	0.701	0.813	1	
PG3	0.594	0.568	0.544	0.672	0.640	0.635	0.670	0.709	0.745	0.664	0.635	0.600	0.721	0.761	0.674	0.712	0.691	0.778	0.764	1

C-3: The Higher Behavioral Support-Need Group

	PA1	PA2	PA3	PB1	PB2	PB3	PC1	PC2	PC3	PD1	PD2	PD3	PE1	PE2	PF1	PF2	PF3	PG1	PG2	PG3
M	0.647	0.577	0.538	0.625	0.657	0.547	0.651	0.673	0.715	0.682	0.648	0.730	0.563	0.658	0.589	0.613	0.617	0.621	0.573	0.672
SD	0.171	0.183	0.203	0.147	0.118	0.148	0.139	0.140	0.131	0.181	0.153	0.192	0.147	0.139	0.163	0.158	0.193	0.123	0.122	0.184
PA1	1																			
PA2	0.824	1																		
PA3	0.804	0.822	1																	
PB1	0.656	0.623	0.588	1																
PB2	0.644	0.611	0.571	0.809	1															
PB3	0.672	0.643	0.623	0.735	0.713	1														
PC1	0.625	0.600	0.559	0.654	0.604	0.628	1													
PC2	0.533	0.511	0.476	0.583	0.552	0.562	0.748	1												
PC3	0.477	0.455	0.414	0.594	0.554	0.530	0.713	0.792	1											
PD1	0.478	0.448	0.420	0.546	0.503	0.518	0.592	0.575	0.572	1										
PD2	0.484	0.453	0.431	0.525	0.491	0.525	0.591	0.555	0.534	0.870	1									
PD3	0.466	0.436	0.413	0.474	0.441	0.446	0.550	0.536	0.524	0.795	0.800	1								
PE1	0.692	0.709	0.668	0.634	0.592	0.640	0.656	0.656	0.639	0.532	0.501	0.506	1							
PE2	0.659	0.652	0.617	0.681	0.649	0.677	0.657	0.646	0.648	0.587	0.552	0.527	0.769	1						
PF1	0.561	0.533	0.508	0.664	0.598	0.600	0.628	0.553	0.573	0.587	0.552	0.514	0.632	0.661	1					
PF2	0.537	0.503	0.465	0.665	0.588	0.577	0.636	0.589	0.617	0.594	0.557	0.529	0.633	0.647	0.747	1				
PF3	0.623	0.590	0.562	0.644	0.555	0.610	0.650	0.591	0.606	0.585	0.544	0.495	0.686	0.697	0.739	0.706	1			
PG1	0.467	0.444	0.413	0.573	0.541	0.542	0.600	0.612	0.627	0.601	0.566	0.511	0.607	0.636	0.602	0.664	0.623	1		
PG2	0.439	0.410	0.378	0.546	0.508	0.505	0.550	0.569	0.583	0.559	0.525	0.466	0.573	0.608	0.596	0.651	0.627	0.752	1	
PG3	0.423	0.398	0.364	0.527	0.471	0.475	0.542	0.629	0.659	0.561	0.496	0.498	0.594	0.637	0.565	0.621	0.598	0.706	0.680	1

C-4: The Lower Behavioral Support-Need Group

	PA1	PA2	PA3	PB1	PB2	PB3	PC1	PC2	PC3	PD1	PD2	PD3	PE1	PE2	PF1	PF2	PF3	PG1	PG2	PG3
M	0.543	0.491	0.440	0.527	0.583	0.461	0.556	0.600	0.630	0.565	0.565	0.639	0.466	0.554	0.441	0.486	0.445	0.550	0.497	0.551
SD	0.237	0.233	0.248	0.201	0.169	0.185	0.197	0.175	0.173	0.234	0.182	0.249	0.194	0.195	0.226	0.219	0.251	0.156	0.150	0.227
PA1	1																			
PA2	0.868	1																		
PA3	0.855	0.863	1																	
PB1	0.744	0.730	0.699	1																
PB2	0.742	0.725	0.695	0.864	1															
PB3	0.765	0.757	0.740	0.797	0.792	1														
PC1	0.687	0.650	0.611	0.727	0.662	0.682	1													
PC2	0.623	0.601	0.564	0.678	0.668	0.657	0.778	1												
PC3	0.618	0.594	0.553	0.687	0.682	0.639	0.765	0.832	1											
PD1	0.648	0.615	0.593	0.691	0.645	0.660	0.727	0.672	0.666	1										
PD2	0.631	0.593	0.564	0.673	0.624	0.639	0.741	0.683	0.677	0.874	1									
PD3	0.628	0.588	0.566	0.615	0.592	0.580	0.658	0.631	0.637	0.777	0.791	1								
PE1	0.805	0.810	0.786	0.736	0.706	0.748	0.743	0.724	0.728	0.693	0.679	0.66	1							
PE2	0.773	0.763	0.741	0.776	0.758	0.766	0.736	0.732	0.728	0.723	0.696	0.664	0.847	1						
PF1	0.713	0.678	0.662	0.743	0.670	0.697	0.735	0.650	0.653	0.719	0.701	0.638	0.763	0.745	1					
PF2	0.694	0.663	0.634	0.750	0.676	0.682	0.753	0.682	0.694	0.725	0.704	0.642	0.760	0.753	0.837	1				
PF3	0.709	0.684	0.673	0.711	0.630	0.676	0.722	0.652	0.662	0.715	0.687	0.612	0.766	0.747	0.834	0.813	1			
PG1	0.584	0.567	0.535	0.676	0.642	0.640	0.721	0.728	0.737	0.696	0.696	0.617	0.700	0.731	0.695	0.735	0.695	1		
PG2	0.599	0.579	0.553	0.670	0.630	0.636	0.686	0.696	0.702	0.696	0.679	0.611	0.700	0.732	0.706	0.732	0.713	0.830	1	
PG3	0.611	0.594	0.566	0.675	0.645	0.637	0.698	0.726	0.757	0.678	0.658	0.621	0.714	0.754	0.669	0.717	0.695	0.797	0.775	1

Appendix D: The Test Version 3.0 of the SIS for Children (Thompson et al., 2012)

Supports Intensity Scale for Children
Field Test Version 3.0

American Association on Intellectual and Developmental Disabilities
April 4, 2012

ASSESSMENT

James R. Thompson - Illinois State University
Michael Wehmeyer - University of Kansas
Carolyn Hughes – Vanderbilt University
Susan R. Copeland - University of New Mexico
Todd D. Little - University of Kansas
Shea Obremski - University of Kansas
James R. Patton - University of Texas
Ed Polloway - Lynchburg College
Rodney E. Realon - Realon Consulting Services
Robert Schalock – Schalock Consultants
Debbie Shelden – Illinois State University
Marc J. Tassé – University of South Florida

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Children's SIS: Demographic Information:

Part A. Information about the interviewer

Name: _____ **Agency/School:** _____ **City, State:** _____

Gender: ❑ Male ❑ Female **Education:** ❑HS Diploma ❑ 2-yr. degree ❑ BS/BA ❑ Master's Degree ❑ Doctoral Degree

Ethnic Background: ❑ White – Non-Hispanic ❑ Black – Non-Hispanic ❑ Asian/Pacific Islander ❑ Native People ❑ Hispanic

❑Multiple ethnic backgrounds ❑ Other (specify _____)

Years of Work Experience in Services to Children or Youth with Disabilities: _____ **years**

Current Workplace Location: ❑Urban/suburban ❑ Rural

Interviewer relationship to child: _____ **number of years known child:** _____

Part B. Information about the respondents

Respondent #1: relationship to child: _____ **number of years known child:** _____

Respondent #2: relationship to child: _____ **number of years known child:** _____

Part C. Information about the child being rated

Gender: ❑ Male ❑ Female **Age:** _____ years, _____ months

IQ Level: ❑ <25 or profound ❑ 25-39 or severe ❑ 40-55 or moderate ❑ 55-70 or mild

Adaptive Behavior Level: ❑ profound ❑ severe ❑ moderate ❑ mild

Ethnic Background: ❑ White – Non-Hispanic ❑ Black – Non-Hispanic ❑ Asian/Pacific Islander ❑ Native People ❑ Hispanic

❑Multiple ethnic backgrounds ❑ Other (specify _____)

Home Residence: ❑ Family Home ❑ Foster family home ❑ Small group home (<7 residents) ❑ Midsize group home (7-15 residents)

❑ Large residential school/facility (>15 residents) ❑ Other residential facility (specify _____)

Presence of disabilities (check all that apply): ❑ Intellectual disability/mental retardation ❑ Low vision/Blindness

❑ Deafness/hearing impairment ❑ Psychiatric disability ❑ Developmental delay ❑ Physical disability: Arm/hand limitations

❑ Physical disability: Mobility limitations ❑ Chronic health condition ❑Autism Spectrum Disorder (ASD) ❑Brain/neurological damage

❑ Speech disorder ❑ Language disorder ❑ Learning disability ❑Attention Deficit Hyperactivity Disorder (AD/HD) ❑ Other (specify)

_____

Primary language understood: ❑English ❑ Spanish ❑ French ❑ Other (specify _____)

List of Assistive Technologies the Child Uses: _____

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Section II. Estimates of Support Needs

Instructions: Interviewers, Please read the name and description of each support domain, and request that each respondent rate the child's support needs on a scale of 1 to 5 using the following criteria. Please stress that ratings should be made in relation to typically functioning children of the same age.

No extra support needed		Medium support needed		Total support needed
1	**2**	**3**	**4**	**5**

Respondent #1:

Home Living Activities *Activities completed as a function of living in a household*	**Community & Neighborhood Activities** *Activities completed as a function of being a member of a community or neighborhood*	**School Participation Activities** *Activities associated with participating in the school community*	**School Learning Activities** *Activities associated with acquiring knowledge and/or skills while attending school*	**Health and Safety Activities** *Activities that assure safety and health across home, school, and community environments.*	**Social Activities** *Activities that pertain to social integration with others, both children and adults.*	**Advocacy Activities** *Activities related to acting as a causal agent in one's life, making choices and decisions, and availing oneself of leadership opportunities.*
1 2 3 4 5	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**

Respondent #1: Rate the child's **overall** support needs by circling the appropriate number (1-5) relative to other children the same age

No extra support needed		Medium support needed		Total support needed
1	2	3	4	5

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Respondent #2:

Home Living Activities *Activities completed as a function of living in a household*	**Community & Neighborhood Activities** *Activities completed as a function of being a member of a community or neighborhood*	**School Participation Activities** *Activities associated with participating in the school community*	**School Learning Activities** *Activities associated with acquiring knowledge and/or skills while attending school*	**Health and Safety Activities** *Activities that assure safety and health across home, school, and community environments.*	**Social Activities** *Activities that pertain to social integration with others, both children and adults.*	**Advocacy Activities** *Activities related to acting as a causal agent in one's life, making choices and decisions, and availing oneself of leadership opportunities.*
1 2 3 4 5	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**	**1 2 3 4 5**

Respondent #2: Rate the child's **overall** support needs by circling the appropriate number (1-5) relative to other children the same age

No extra support needed		Medium support needed		Total support needed
1	2	3	4	5

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PART I: EXCEPTIONAL MEDICAL AND BEHAVIORAL NEEDS

(Item descriptions in Instructions)

0 = No Support Needed;
1 = Some Support Needed (i.e., providing monitoring and/or occasional assistance);
2 = Extensive Support Needed (i.e., providing regular assistance to manage the medical condition or behavior).

MEDICAL			
Respiratory care			
Inhalation or oxygen therapy	0	1	2
Postural drainage	0	1	2
Chest PT	0	1	2
Suctioning	0	1	2
Feeding assistance			
Oral stimulation or jaw positioning	0	1	2
Tube feeding (e.g., nasogastric)	0	1	2
Parenteral feeding (e.g., IV)	0	1	2
Skin care			
Turning or positioning	0	1	2
Dressing of open wound(s)	0	1	2
Other exceptional medical care			
Protection from infectious diseases due to immune system impairment	0	1	2
Seizure management	0	1	2
Dialysis	0	1	2
Ostomy care	0	1	2
Lifting and/or transferring	0	1	2
Eating Disorders	0	1	2
Therapy Services	0	1	2
Allergies	0	1	2
Diabetes Management	0	1	2
Other(s) – List all that apply			
_____	0	1	2
_____	0	1	2

BEHAVIORAL			
Externally-directed destructiveness			
Prevention of assaults or injuries to others	0	1	2
Prevention of property destruction (e.g., fire setting, breaking furniture)	0	1	2
Prevention of stealing	0	1	2
Self-directed destructiveness			
Prevention of self-injury	0	1	2
Prevention of pica (ingestion of inedible substances)	0	1	2
Prevention of suicide attempts	0	1	2
Sexual			
Prevention of sexual aggression	0	1	2
Prevention of non-aggressive but inappropriate sexual behavior	0	1	2
Other exceptional behavioral concerns			
Prevention of tantrums or emotional outbursts	0	1	2
Prevention of wandering	0	1	2
Prevention of substance abuse	0	1	2
Maintaining mental health treatments	0	1	2
Prevention of Truancy	0	1	2
Other(s) – List all that apply			
_____	0	1	2
_____	0	1	2
_____	0	1	2

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PART II: SUPPORTS NEEDS SCALE

PART II. Support Needs Scale Section A: Home Life Activities	TYPE					FREQUENCY					DAILY SUPPORT TIME				
1. Completing household chores	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Eating	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Washing and keeping self clean	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Dressing	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Using the toilet	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Sleeping and/or napping	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Keeping track of personal belongings at home	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Keeping self occupied during unstructured time (free time) at home	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
9. Operating electronic devices	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

Type of Support	Frequency of Support	Daily Support Time
0 = none 1 = monitoring 2 = verbal/gestural prompting 3 = partial physical assistance 4 = full physical assistance	0 = **Negligible**; the child's support needs are rarely if ever different than same-aged peers in regard to frequency. 1 = **Infrequently**; the child will occasionally need someone to provide extraordinary support that same-aged peers will not need. 2 = **Frequently**; in order for the child to participate in the activity, extra support will need to be provided for about half of the occurrences of the activity. 3 = **Very Frequently**; in most occurrences of the activity the child will need extra support that same-aged peers will not need. 4 = **Always**; on every occasion that the child participates in the activity, the child will need extra support that same-aged peers will not need.	0 = none 1 = less than 30 minutes 2 = 30 minutes to less than 2 hours 3 = 2 hours to less than 4 hours 4 = 4 hours or more

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PART II. Support Needs Scale **Section B: Community and Neighborhood Activities**	**TYPE**					**FREQUENCY**					**DAILY SUPPORT TIME**				
1. Moving around the neighborhood and community	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Participating in leisure activities that require physical activity	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Participating in leisure activities that do not require physical exertion	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Using public services in one's community or neighborhood.	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Participating in community service and religious activities.	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Shopping	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Complying with basic community standards, rules, and/or laws	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Attending special events in the community or neighborhood such as cookouts/picnics, cultural festivals, music/art fairs, or holiday oriented events	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

Type of Support	**Frequency of Support**	**Daily Support Time**
0 = none 1 = monitoring 2 = verbal/gestural prompting 3 = partial physical assistance 4 = full physical assistance	0 = **Negligible**; the child's support needs are rarely if ever different than same-aged peers in regard to frequency. 1 = **Infrequently**; the child will occasionally need someone to provide extraordinary support that same-aged peers will not need. 2 = **Frequently**; in order for the child to participate in the activity, extra support will need to be provided for about half of the occurrences of the activity. 3 = **Very Frequently**; in most occurrences of the activity the child will need extra support that same-aged peers will not need. 4 = **Always**; on every occasion that the child participates in the activity, the child will need extra support that same-aged peers will not need.	0 = none 1 = less than 30 minutes 2 = 30 minutes to less than 2 hours 3 = 2 hours to less than 4 hours 4 = 4 hours or more

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PART II. Support Needs Scale **Section C: School Participation Activities**	**TYPE**					**FREQUENCY**					**DAILY SUPPORT TIME**				
1. Being included in general education classrooms	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Participating in activities in common school areas (e.g., playground, hallways, cafeteria)	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Participating in co-curricular activities	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Getting to school (includes transportation)	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Moving around within the school and transitioning between activities	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Participating in large-scale test taking activities required by state education systems	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Following classroom and school rules	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Keeping track of personal belongings at school	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
9. Keeping track of schedule at school	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

Type of Support	**Frequency of Support**	**Daily Support Time**
0 = none 1 = monitoring 2 = verbal/gestural prompting 3 = partial physical assistance 4 = full physical assistance	0 = **Negligible**; the child's support needs are rarely if ever different than same-aged peers in regard to frequency. 1 = **Infrequently**; the child will occasionally need someone to provide extraordinary support that same-aged peers will not need. 2 = **Frequently**; in order for the child to participate in the activity, extra support will need to be provided for about half of the occurrences of the activity. 3 = **Very Frequently**; in most occurrences of the activity the child will need extra support that same-aged peers will not need. 4 = **Always**; on every occasion that the child participates in the activity, the child will need extra support that same-aged peers will not need.	0 = none 1 = less than 30 minutes 2 = 30 minutes to less than 2 hours 3 = 2 hours to less than 4 hours 4 = 4 hours or more

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PART II. Support Needs Scale **Section D: School Learning Activities**	**TYPE**					**FREQUENCY**					**DAILY SUPPORT TIME**				
1. Accessing grade level curriculum content	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Learning academic skills	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Learning and using metacognitive strategies	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Completing academic tasks (e.g., time, quality, neatness, organizational skills)	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Learning how to use and using educational materials, technologies, and tools	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Learning how to use and using problem solving and self-regulation strategies in the classroom	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Participating in classroom level evaluations, such as tests	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Accessing the health and physical education curricula	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
9. Completing homework assignments	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

Type of Support	**Frequency of Support**	**Daily Support Time**
0 = none 1 = monitoring 2 = verbal/gestural prompting 3 = partial physical assistance 4 = full physical assistance	0 = **Negligible**; the child's support needs are rarely if ever different than same-aged peers in regard to frequency. 1 = **Infrequently**; the child will occasionally need someone to provide extraordinary support that same-aged peers will not need. 2 = **Frequently**; in order for the child to participate in the activity, extra support will need to be provided for about half of the occurrences of the activity. 3 = **Very Frequently**; in most occurrences of the activity the child will need extra support that same-aged peers will not need. 4 = **Always**; on every occasion that the child participates in the activity, the child will need extra support that same-aged peers will not need.	0 = none 1 = less than 30 minutes 2 = 30 minutes to less than 2 hours 3 = 2 hours to less than 4 hours 4 = 4 hours or more

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PART II. Support Needs Scale **Section E: Health & Safety Activities**	**TYPE**					**FREQUENCY**					**DAILY SUPPORT TIME**				
1. Communicating health related issues and medical problems, including aches and pains	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Maintaining physical fitness	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Maintaining emotional well-being	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Maintaining health and wellness	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Implementing routine first aid when experiencing minor injuries such as a bloody nose	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Responding in emergency situations	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Protecting self from physical, verbal, and/or sexual abuse	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Avoiding health and safety hazards	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

Type of Support	**Frequency of Support**	**Daily Support Time**
0 = none 1 = monitoring 2 = verbal/gestural prompting 3 = partial physical assistance 4 = full physical assistance	0 = **Negligible**; the child's support needs are rarely if ever different than same-aged peers in regard to frequency. 1 = **Infrequently**; the child will occasionally need someone to provide extraordinary support that same-aged peers will not need. 2 = **Frequently**; in order for the child to participate in the activity, extra support will need to be provided for about half of the occurrences of the activity. 3 = **Very Frequently**; in most occurrences of the activity the child will need extra support that same-aged peers will not need. 4 = **Always**; on every occasion that the child participates in the activity, the child will need extra support that same-aged peers will not need.	0 = none 1 = less than 30 minutes 2 = 30 minutes to less than 2 hours 3 = 2 hours to less than 4 hours 4 = 4 hours or more

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PART II. Support Needs Scale **Section F: Social Activities**	**TYPE**					**FREQUENCY**					**DAILY SUPPORT TIME**				
1. Maintaining positive relationships with others	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Respecting the rights of others	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Maintaining conversation	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Responding to and providing constructive criticism	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Coping with changes in routines and/or transitions across social situations	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Making and keeping friends	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Communicating with others in social situations	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Respecting others personal space/property	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
9. Protecting self from exploitation and bullying	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

Type of Support	**Frequency of Support**	**Daily Support Time**
0 = none 1 = monitoring 2 = verbal/gestural prompting 3 = partial physical assistance 4 = full physical assistance	0 = **Negligible**; the child's support needs are rarely if ever different than same-aged peers in regard to frequency. 1 = **Infrequently**; the child will occasionally need someone to provide extraordinary support that same-aged peers will not need. 2 = **Frequently**; in order for the child to participate in the activity, extra support will need to be provided for about half of the occurrences of the activity. 3 = **Very Frequently**; in most occurrences of the activity the child will need extra support that same-aged peers will not need. 4 = **Always**; on every occasion that the child participates in the activity, the child will need extra support that same-aged peers will not need.	0 = none 1 = less than 30 minutes 2 = 30 minutes to less than 2 hours 3 = 2 hours to less than 4 hours 4 = 4 hours or more

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PART II. Support Needs Scale **Section G: Advocacy Activities**	**TYPE**					**FREQUENCY**					**DAILY SUPPORT TIME**				
1. Expressing preferences	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2. Setting personal goals	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
3. Taking action and attaining goals	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
4. Making choices and decisions	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
5. Advocating for and assisting others	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
6. Learning and using self-advocacy skills	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
7. Communicating personal wants and needs	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
8. Participating in educational decision making	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
9. Learning and using problem solving and self-regulation strategies in the home and community	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4

REMEMBER TO SCORE SUPPORT NEEDS AS IF THE CHILD IS DOING THE ACTIVITY EVEN IF HE/SHE CURRENTLY DOES NOT!

SCORING KEY

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General Comments/Feedback for Supports Intensity Scale for Children

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